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ADDRESSES.

CHAIRMAN'S ADDRESS.

Delivered in the Section on Materia Medica, Pharmacy and Therapeutics, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

BY WARREN B. HILL, M.D.
MILWAUKEE, WIS.

The progress in medicine during the last fifty years has been such as to revolutionize its principles and practice. Empiricism has largely given way to rationalism, and physiologic and pathologic investigation has led to rational therapeutics. A great impetus has thus been given to pharmacy, while the experimental and physiologic laboratory has been the means of more accurate study into the physiologic action of drugs, and today we prescribe drugs with a degree of certainty as to their physiologic actions, little dreamed of by our earlier brothers in medicine. The advance in organic chemistry has enabled us to isolate the various active principles in remedial agents, so that it is possible, to a large extent, to produce physiologic effects by the use of alkaloids, unhampered by antagonistic and irritant substances which might be contained in the crude drug, thus bringing therapeutics to an exactness entirely inconsistent with former conditions.

Physiologic chemistry and advance in biology, has stimulated pharmacy in the line of synthetic chemistry, and today the laboratories of the world are busy producing new and sometimes useful compounds which are calculated to produce exact physiologic effects, based on the known actions of their chemic components. To mention the most conspicuous of these newer remedies would be tedious in the extreme, and to pass judgment on them, selecting the most useful, would be rash at this time, for the test of time is necessary and careful discrimination and experience will demonstrate their several virtues or shortcomings. The production of a number of useful and popular remedies of this kind has (unduly perhaps) stimulated energy along the line of multiplication of remedies, and the strife of the manufacturers has been such as to sometimes overlook the object, which is to produce something new and useful, and thereby earn for themselves a rich reward of fame and fortune—but rather to produce something which will sell, aided by the perfected art of advertising, which has (it seems to me) reached its acme in this—the closing decade of this our glorious nineteenth century. This evil tendency of multiplying pharmaceutic names, as well as remedies, is working mischief both in the medical and the pharmaceutic professions. The mercenary pharmaceutic chemist attacks his brother physician in his most vulnerable spot—his materia medica. He eliminates his necessity for remembering aught of incompatibles, and furnishes him ready-made compounds, with physiologic action and indications printed on the label, under a name that the chemist calls his own.

The mode of preparation of the remedy, as well as its exact composition, he retains as his own property, and it is a sad commentary on the progress of medicine during the last fifty years, that the record from the drug stores in the United States gives indisputable proof that the average physician (yes, a large majority of the profession, to a greater or lesser extent) encourges this baneful practice by his patronage. It demoralizes pharmacy, because pharmacists are no longer called upon to exert their knowledge and skill at compounding, but are required by the doctor, to put up so-called proprietary remedies, and their only care is not to make a mistake and put "B. J's." elixir when "J. B's." is called for.

At this rate of progress we will, in a short time, no longer need pharmacies, but commercial institutions, known as drug stores, will be all that is necessary. The commercial conditions into which pharmacists have been forced by a combination of manufacturing chemists and the doctors, has led to the evil of substituting, on the part of the druggist, and to a feeling of distrust on the part of the physician, who in turn incurs the enmity of the druggist by dispensing his own drugs by the aid of the manufacturing chemist, who kindly furnishes him, at wholesale, his favorite remedies put up in suitable vials already labeled for use. The ire of the druggist finds vent in counter-prescribing the very secret compounds which his former friend, the doctor, compelled him to have on the shelves.

Thus we see that the progress of pharmaceutic activity, in this one direction, has a tendency to alienate the two professions which are dependent upon each other and should work in harmony for the benefit of mankind. The remedy is simple. We are not to turn backward and ignore the progress in pharmacy and chemistry, but, on the contrary, we, as physicians, should amend our code of ethics so as to recognize *new* and *useful* remedies, and recognize the value of the time, knowledge and skill of those who, by their industry, bring to us the products of their labor. We should insist on the knowledge of the exact method of the preparation, its action, and composition of the product; and should extend to the discoverer the same rights of protection that we do to authors and inventors, and finally stamp out the secret nostrum man by a higher and more thorough education in materia medica and therapeutics in our medical colleges.

There was a time, not many years ago (when empiricism held sway), that therapeutics was the mainstay of the physician; but investigation has led us off into scientific and speculative fields, until now, in the field of medicine, the question of etiology and pathology are so all-absorbing that the treatment of disease is passed by with only a passing mention. While it is true that the enthusiasm and energy along these

lines is what has brought medicine out of the depths of empiricism into the broad light of rationalism, it is necessary for us to bring back to its old estate the unpopular branch of therapeutics. For, after all, after we have learned to diagnose, detail the symptoms, talk learnedly of the etiology, the all-absorbing question to the patient is, "what are you going to do for me?"

We have the broad foundation of the years of investigation on which to build our structure of rational therapeutics, and we, as physicians, should join hands with our brothers in pharmacy, to provide a rational treatment for disease. There has been much done in this direction during the last few years. We have just entered on a new epoch in the history of therapeutics. Bacteriologic investigation has opened up new channels for thought and action, and today we have achieved a signal victory in the cure of disease by serum therapy. The remarkable result achieved in the treatment of diphtheria, by the use of antitoxin, has demonstrated that there is a legitimate field for investigation and discovery in this direction. The days of terror from the streptococcus seem to be numbered, as that serum is being so perfected that we have every reason to believe that in a short time erysipelas and kindred diseases will no longer resist treatment as they have in the past.

Tuberculosis is being attacked from several quarters, and tetanus and typhoid fever must, sooner or later, succumb to the treatment of antitoxins. Still, the field is large, the laborers comparatively few, and serum therapy is in its infancy. The use of toxins has been resorted to but little except experimentally on lower animals, but the time is at hand when they will be brought to their full share of usefulness. The human system may be made immune by the judicious use of toxins, the antitoxins being generated within the organism instead of being introduced from without, having been produced first in some other form of animal life.

The question now arises, "what is it that makes the serum antitoxic?" Can we not go farther, and, from the serum, isolate an active principle, as we did from Peruvian bark? Shall we not extend our chemic research into the realms of the animal organism, and find the antidote for the poisons generated within the human system?

These seem to me to be the vital questions of the day, and if we work with the same zeal that our colaborers have, in their investigation, we will have a new materia medica, a new pharmacy, a new therapeutics, that will attract the attention of not only the medical profession but of all humanity. For, it is here that disease will be robbed of its terrors, it is here that the acme of medical knowledge will be attained—the *cure* of disease.

DISCUSSION.

Dr. WOODBURY expressed the hope that biologic or organic chemistry would soon be able to isolate the effective constituents and present them as simple chemic substances, the dosage of which could then be definitely established and the physiologic actions of which could be investigated so as to place serum therapy on a scientific basis. The use of toxins for immunization appears to be a step in this direction.

Dr. STEWART recommended the reference of the address to the Executive Committee, and also to the American Pharmaceutical Association, which was agreed to.

Dr. HILL said that the remarks on the subject of toxins had called up in his mind, an interesting case of a man who had been accidentally rendered immune of erysipelas by the use of Dr. Coley's toxins from the streptococcus erysipelatis. The man was suffering with inoperable sarcoma of the neck. Rather with the idea of amusing the patient then with any hope of checking the growth, Dr. Hill resorted to injections of this serum. At first he used, daily, one injection of five or ten minims, which was sufficient to cause decided reaction including an eruption on the skin resembling erysipelas. The patient finally died, but what Dr. Hill wanted to bring particularly to notice was that he became so accustomed to the toxin that even the injection of ten cubic centimeters of toxin would produce no reaction whatever. He was absolutely immune to the streptococcus. He might be operated on without danger of pus formation; his abdomen might be opened and a pint of pus poured in and he would not have peritonitis, and he need not fear septicemia. It occurred to Dr. Hill that this condition was not due to stimulation of the leucocytes, or their increase in number, or to phagocytic action; but it was the fixed tissue cells which were modified in their functions by the toxin injections, then having caused a stimulation and incidental changes so that there was induced a special antagonism. A new set of cells was formed with the special function of generating antitoxin.

Two practical results came from this experiment. In that class of cases, where the patient after operation is especially liable to streptococcus invasion, not due to dirty surgery, but necessarily suppurating cases—if we are aware of this liability would it not be our duty to make the patient immune before we commenced the operation? The second thought is in reference to the action of the antitoxins in the system. There was, in his opinion, an alkaloid in the antitoxin, which did the work, and it is the proper field of analytic chemistry to discover and isolate this principle. We have known for fifty years or more, that a man may render himself immune to tobacco, or nicotin. How is this accomplished? It is brought about by the building up of a new set of cells of superior powers of resistance, and which secrete substances which make the system immune to the toxins. The same result follows the constant use of morphin, and a tolerance to the drug is established. It has been found that when a rabbit has become accustomed to morphin, and is not affected by a large dose, if we take the blood of this rabbit and inject it into another one, not thus accustomed to its effects, the blood will render the latter also immune to the usual fatal dose of morphin. Therefore, by this method, we have not only a means of counteracting the animal poisons, but also poisons of all kinds. It is in this direction of producing immunity from disease and protection from toxic agents of mineral, vegetable or animal origin, that clinical medicine has a most promising field before it. The workers in the department of bacteriology have done their share; it is our duty to take up the work where they have left off and isolate the remedial agents and determine their physiologic actions and therapeutic applications.

ADDRESS OF WELCOME TO DELEGATES FROM THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Delivered in the Section on Materia Medica, Pharmacy and Therapeutics, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

BY WARREN B. HILL, M.D.

MILWAUKEE, WIS.

Gentlemen of the American Pharmaceutical Association:—We feel honored by your presence here today. The significance of the meeting of the representatives of the two great professions or, rather, the two branches of the one great profession of medicine, is well worthy of consideration.

Thoughtless men little realize how closely the professions of pharmacy and medicine are bound together, how dependent the one is upon the other, and yet how seldom we come together for our common weal. There is a tendency toward estrangement rather than that coöperation which should exist between the two, and the only way to overcome this estrangement is by coming together and cementing our friendship with united work.

The pharmacist is the right hand supporter of the doctor. He is especially fitted for his part of the work, and without his support, the doctor would indeed be in a sorry plight. The perfection of our armamentarium depends on our fellow laborer in the pharmaceutic profession. The leaders in your pro-

V 29
1897

fession have in the past and are at present giving their best efforts to bring pharmacy up to the highest standard of professionalism, where it rightfully belongs, but they are hampered and impeded in their work by the commercial druggist, who with the aid of the commercial doctor are the means of disseminating nostrums broadcast throughout the land and bringing down from its high estate the practice of medicine and pharmacy.

The danger of commercialism in our profession is patent to every observant mind, and it should call forth a stronger effort on our part toward a united action in the progressive work in which we are engaged. The Section of Materia Medica, Pharmacy and Therapeutics, gives us a place in our National Association where we may come together, and bring to each other the results of our work and investigation; a place to cement our friendships and receive fresh enthusiasm in our common work.

I wish to honor your colleague, Prof. Rusby, for the work he has instituted in the "joint investigation," a work that can not be over estimated, and now, having been instituted, should be carried on and developed to such an extent in the future that its power and influence should be felt in the medical world. I would suggest that each of us go to our homes with the importance of this work so impressed upon us, that we use every effort to establish such a system of collaboration in the State societies to which we belong, and bring our State pharmaceutical and medical societies into closer contact.

I, therefore, welcome you, delegates from the American Pharmaceutical Association, to our society as co-laborers. I welcome you to the work in which we are engaged in the practice of medicine, and I trust the day is not far distant when your profession will not be looked upon as something apart from ours, but regarded as one of the settings in the grand mosaic that goes to make up that noble profession which disregards self in the work of alleviating suffering and restoring physical man.

RESPONSE BY F. W. STEWART.

Chairman of the Committee from the American Pharmaceutical Association.

It gives me great pleasure to respond to your address of welcome on behalf of the delegation from the American Pharmaceutical Association. In making this response, I desire to call your attention to the fact that this delegation, consisting of thirty-one leading pharmacists, representing every section of the United States, is here by invitation of the AMERICAN MEDICAL ASSOCIATION. The object the ASSOCIATION had in extending an invitation to the National Association of Pharmacists to take part in the deliberations of the National Association of Physicians was, and is, the recognition of pharmacy as a part of medical science and practice; not the recognition of commercial pharmacy by the commercial physician, but the recognition of professional pharmacy by the professional physician.

The professional physician, in thus recognizing pharmacy as a part of medical science and practice, requires that the pharmacist shall comply with professional requirements; and the delegation of the national organization of pharmacists, by its presence here, admits that pharmacy should be practiced with the same beneficent object as medicine.

Medicine is not only a liberal and beneficent profession but it is a fraternity as well. From the earliest times the medical profession has been a fraternal organization. We still believe in the Hippocratic oath and its obligations. The physician must, therefore, serve his profession, and his standing in the profession should depend upon the manner in which he meets his fraternal obligations. It is, therefore, considered unprofessional for a physician to withhold the knowledge of discovery from his professional brethren for the purpose of obtaining advantage over his fellows in practice. Furthermore, the practice of medicine is dependent on progress in the knowledge of disease and the methods for treating those afflicted with disease. This knowledge, published in medical literature, and classified in scientific forms, constitutes the science of medicine. The service of the professional physician is, therefore, toward the cause of suffering humanity, the cause of public health, the cause of the professional brotherhood of which he is a member, and the cause of medical science. As a member of the subsidiary profession of pharmacy the pharmacist is bound by similar obligations to humanity, to science, to his professional brethren and to the medical profession.

You have heard that the pharmacist is the servant of the public. So he is; but his contact with the public should be through the physician and under the guidance and control of the medical profession. The preparation of medicine must always be subservient to the application of medicine to the treatment of the sick; therefore pharmacy is subservient to therapy; and the pharmacist is subservient to the physician. He is not educated to practice medicine and should leave that important and responsible vocation to the physician. This does not apply to the pharmacist who is also a physician, though the practice of both pharmacy and therapy by the same individual is objected to by some. The pharmacist owes it to the physician, with whom he is, or should be, in fraternal relations, not to interfere with the physician's prerogatives on the one hand; and he is under obligations on the other hand to discountenance those who do so interfere.

The vocation of the professional pharmacist is, therefore, to aid the physician in his efforts to combat disease, by working hand in hand with him as his professional brother, devoting himself to the study of drugs from every possible point of view, and furnishing the same in the form of scientifically prepared pharmaceutic preparations with published formulæ and open methods of manufacture.

But if we are to have a profession of pharmacy devoted to the service of the medical profession as the "physician's right-hand supporter and co-laborer," as you have said, the medical profession will have to foster and protect such professional pharmacists in the pursuit of their profession. There is only one way to do this, and that is to throw the patronage of the profession into the hands of those pharmacists who practice pharmacy professionally.

The medical profession can not be blamed for withholding its patronage from druggists who prescribe over the counter, renew prescriptions without the sanction of the prescribers, and manufacture and sell nostrums. Under the existing state of affairs the physician may be justified in dispensing his own medicines to protect himself and his patients from such irregular practices. But I claim, as the representative of the delegation of the American Pharmaceutical Association, that the medical profession itself

is more responsible than the pharmacists for the disgraceful state of pharmacal practice, for by prescribing nostrums of secret and secret composition, and patented medicines until, in some localities, about one-half of the medicines prescribed are of a secret or proprietary nature, physicians have forced pharmacists to keep such medicine in stock to supply the very demand the physicians themselves have created. Educated and professional pharmacists everywhere deplore the condition of affairs, but are powerless to prevent it. The reform must come from the medical profession itself. Let every physician refuse to prescribe medicines controlled by patents, secret formulas, and so-called trade-marks, and send their prescriptions to professional pharmacists who practice pharmacy under professional and scientific requirements, and the nostrum trade would soon be forced back to the lowest depths of the infernal regions from whence it came. Then let the two professions come to some proper understanding in relation to the sale of such open formula household remedies for certain minor ailments, for which the public will always patronize the drug store, and we will have secured the desirable object so well described by the Chairman in his very able address.

ORIGINAL ARTICLES.

ON THE THERAPEUTIC PROPERTIES OF ALCOHOL AND THE REASONS WHY THE FERMENTED AND DISTILLED LIQUORS USED AS BEVERAGES SHOULD NOT BE RECOGNIZED IN THE PHARMACOPEIA AS MEDICINAL AGENTS.

Presented to the Section on Materia Medica, Pharmacy and Therapeutics at the Forty-eighth Annual Meeting of the American Medical Association held at Philadelphia, June 1-4, 1897.

BY N. S. DAVIS, A.M., M.D., LL.D.

CHICAGO.

Pure ethyl alcohol, undiluted, is regarded by all chemists and intelligent physicians as an active poison, rapidly destructive of both vegetable and animal life whenever brought into contact with either. The presence of absolute alcohol in contact with any living tissue immediately arrests all natural metabolic and vital processes in such tissue, and causes it to become corrugated or shrunken and dead. Swallowing absolute alcohol, undiluted, as quickly destroys the vitality of the membranes of the mouth, throat and stomach, and kills the individual, as does pure carbolic acid. Consequently, alcohol, in its pure and undiluted state, is not capable of being used as a medicine, but when largely diluted with water, as it is in all the fermented and distilled beverages, its direct corrosive or corrugating effect upon the membranes it comes in contact with is so much diminished that it is capable of being absorbed and conveyed in the blood to all parts of living body. In this diluted condition, therefore, it early began to be used both as a medicine and as a popular drink, and as the most readily appreciable effect was to diminish the individual's consciousness of impressions, not only from without but also from within, it soon came to be regarded as a universal tonic and restorative. Its supposed tonic and restorative effects were based wholly on the sensations and movements of patients or individuals under the influence of moderate doses, for it was soon demonstrated that large doses directly diminished strength, sensibility and action. But when under the influence of moderate doses the patient said he felt less weak, or weary; felt the sensation of cold or heat as pain less, felt lighter or more buoyant and his heart was found to beat faster, it was perfectly natural for both physician and patient to think the alcohol was acting as a tonic or stimulant and general restorative. It was not until the advancement in analytic chemistry and the physiology of all parts of the nerve structures of man, coupled with the researches of physics and biology of the last half century, that we have had it in our power to prove the incorrectness of these conclusions founded on the sensations and actions of the patient under its influence. The more recent chemico-physiologic researches have shown more clearly the composition of the blood and the various tissues of the body, and especially the existence and functions of the hemoglobin, leucocytes and other corpuscular elements of both blood and tissues, and the part each plays in the reception and internal distribution of oxygen with its effects on all the metabolic changes in living bodies. By the same class of researches it is shown that alcohol, diluted with water and taken into the stomach, is rapidly absorbed by the capillaries and is conveyed in the blood to every tissue in the body and by its presence retards the natural metabolic changes, lessens the processes of oxydation and elimination, diminishes nerve sensibility and, when repeated from day to day, induces cell and tissue degenerations. By the more recent studies in the anatomy and physiology of the several parts of the nervous system it has been shown, not only that the action of the heart and the movement of the blood in the vessels are directly under the control of the cardiac and vasomotor nerves, some of the fibers of which are excitors of action while others are inhibitors, by which uniformity and harmony is maintained in the circulation of the blood, but also that our voluntary movements and sensations are manifested by the cerebro-spinal nerves, having their excitors and inhibitors by which we are enabled to co-ordinate muscular contractions and relaxations in executing all complex movements, and equally so it is that our mental actions, manifested through the convolutions of the brain, are regulated by excitors and inhibitors. Every individual whose brain is in its normal condition has frequent sensations, impulses or excitors of mental actions which he promptly inhibits or disregards. Indeed, it is on the proper development of this mental inhibition that every person's self-control and sense of propriety depends. If it is true, as has been already stated, that alcohol when taken into the living system in large doses is an active poison, quickly destroying animal life, and in smaller doses is an anesthetic directly diminishing cerebral sensibility and mental consciousness and retarding all metabolic changes, both in the blood and tissues, it follows as a logical and necessary inference that if administered as medicine it should be done with the same care and exactness in regard to purity, dose and time that we exercise in prescribing morphin, quinin, aconite, arsenic or any other active drug. This can not be done by using any of the various fermented and distilled liquors ordered either from drug stores or liquor dealers, since they are kept at no uniform standard of either strength or purity. The present pharmacopeia recognizes as medicines, vinum or wine, spiritus frumenti or whisky and spiritus vini gallici or

V 29
1897

brandy, but does not give a definite officinal standard of alcoholic strength for either of them. Neither does it give any reliable and readily available tests by which the strength and purity of the articles can be determined by the ordinary practitioner of medicine. Repeated analyses have shown that the amount of alcohol in different samples of wine varies 6 to 25 per cent.; in whisky from 35 to 50 per cent.; and in brandy from 40 to 60 per cent. Such variations in the strength of any other medicine would quickly cause its standard to be corrected or its exclusion from the official list of drugs. As alcohol is the only important therapeutic agent in all these liquors, why not let pure alcohol of fixed strength be officially recognized to the exclusion of all the varieties of both fermented and distilled drinks. Then every practitioner desiring to give alcohol as a remedy could order it with any desired degree of dilution with water and he would know what his patient was getting and how much, and the pharmacist would no longer have need to pay for a license to sell liquors or to be classed with the ordinary dealers in such beverages. One of the most important improvements in modern pharmacology consists in the separation of the active therapeutic agents from the more complex or crude drugs and thereby enables the physician to administer them with far greater convenience and certainty. Very few intelligent physicians of the present day would think of prescribing crude opium when they desired to produce only the anodyne effects of the morphin it contained, certainly not without knowing what per cent. of morphin would be in the crude drug. Why, then, should he prescribe the uncertain mixtures called beer, wine, whiskey or brandy when his sole object is to obtain the therapeutic effects of alcohol? If it is claimed that these several fermented and distliled liquors contain other therapeutic agents in addition to the alcohol, we answer that, so far as any such agents exist, their proportionate quantity and quality are far more variable and uncertain than is their per cent. of alcohol. Almost the only constituents found in whisky and brandy, besides the alcohol and water, are very variable quantities of fusel oil, tannin and, in very old specimens, a trace of some etherial substance to which connoisseurs attribute the special *bouquet*. So far from adding to the therapeutic value, the first two substances are regarded as very undesirabte impurities and the last named has never been isolated in sufficient quantity to have its medical qualities tried. Much has been said and written concerning valuable nutritive constituents in the different varieties of wine, but the numerous analyses on record show only very variable quantities of fecula, saccharin matter, tannin, some vegetable acids and potassium salts, in addition to the alcohol and water. Of these extra ingredients the fecula and saccharin matter are the only ones that could be classed as nutritive or capable of being converted into any natural element of the blood or tissues of the body. The quantity of these in any variety of wine is so limited that it would require several barrels of the wine to furnish the equivalent of a pound of bread. Consequently it would be far more economic as well as more scientifically accurate for every physician to prescribe such doses of pure alcohol and water to be given with such quantify of sugar, milk or meat broth, as he thought his patient might need. The physician who can not do this and thereby accurately adjust the proportion of all the elements his patient may need has certainlyreceived a very defective profesional education. It would be a long and very important step in advance both in the interests of scientific accuracy and of humanity if all physicians when they thought alcohol was needed would prescribe it in the manner just indicated, and if in the next revision of the pharmacopeia only alcohol of standard strength was retained to the exclusion of all fermented and distilled liquors. If these changes were adopted and carried into general practice the result would be a more complete separation of both pharmacist and physician, from connection with or responsibility for, the general traffic in and uses of the various alcoholic liquors in popular use.

DISCUSSION.

Dr. FRANK WOODBURY said that about twelve years ago he had adopted the plan recommended in the paper of substituting diluted alcohol for all forms of alcoholic stimulants in his service in the medical wards of the Medico Chirurgical Hospital, which had been previously suggested by Dr. Dennis of New York. He had used high wines or cologne spirits in water flavored with peppermint or cinnamon. The accuracy of dosage and the absence of all deleterious flavoring substances seemed to make this the preferable method of administering alcohol, at least in all public institutions. As regards the physiologic question, whether or not alcohol increases the energy of the body, it is sufficient to recall the fact determined by Dr. Edward Smith that the excretion of carbonic acid is diminished by spirits, such as brandy or gin, which also diminish the excretion of urea. As bodily force must come from combustion and increased metabolism in the organism, it is evident that alcohol is a force producer only within the limits of its oxidation, and any excess of this small quantity retards waste and checks force production. In therapeutics alcohol is a food, a stimulant to the circulation, a nerve sedative or a narcotic, according to circumstances and dosage.

Professor REMINGTON—As a member of the Committee on Revision of the Pharmacopeia, I think it is only right to state the method which is in vogue with the Committee for introducing various drugs and medicines into the pharmacopeia, and for dropping from the official list such as are undesirable. This is left exclusive to the physicians on the Committee, to whom are intrusted the task of selecting and deciding on the claims of substances and preparations which are proposed for admission into the national pharmacopeia. Now, their action is very largely regulated by the demand and the use of these drugs and chemicals. If they are much used they are retained but if there is no demand by physicians they may be dropped. On my part, I can see no very great objection to the dropping of spiritus frumenti and spiritus vini gallici from the pharmacopeia because they do not enter into any official preparations, but as regards vinum album and vinum rubrum, this would be scarcely possible because they do enter into the composition of preparations such as the wine of ipecac or wine of antimony, for instance, which are official. Therefore it is absolutely necessary for the pharmacopeia to limit the amount of the alcohol and determine the purity of wines and to prescribe tests for determining the value of wines. In the pharmacopeia of 1880 there were very good alcoholimetric tests to ascertain the strength of wines. It is very necessary for the pharmacistto know the exact amount of alcohol in the wine, because if it is deficient in strength the preparation will not keep and if, on the contrary, it is too strong it would become like a tincture and defeat the medical object in view in selecting the wine as a menstruum.

Granted that alcohol is a curse, and I am thoroughly in accord with Professor Davis in his desire to restrict its use, but, granting this, should there not be some authority in the country to decide what shall be dispensed by the druggists when the doctor's prescription calls for wine or brandy? How shall the pharmacist know what is in the mind of the physician when he uses these terms? On the other hand, if such a practical test as Dr. Davis prescribes can be put into the pharmacopeia—though I am not sure this can be done—it would result in this, that it would be in the power of various druggists throughout the country and boards of health everywhere to decide on the tests for purity and strength and there would be no uniformity. If it were a question of driving all alcoholic drinks out of the country, that would be one thing; but, if this is not feasible, would it not be better to have some control over those that are to be used in medicine. The question raised by the paper certainly needs some attention, but should

we not desire to make the tests more exact and the regulation more stringent rather than to leave it without any control whatever? Dr. Rice of the Committee on Revision some years ago received a number of communications from the Western States about the wines and brandies not being up to the standard and suggesting that the standard of the pharmacopeia be made easier of application, and we have now under consideration such a test, which will give more definiteness to the strength. As regards the Committee, I would say that the Committee on Revision are not altogether responsible for the presence of spirtus vini gallici and spiritus frumenti in the pharmacopeia; they are only there because there is use for them and physicians use them. I would, personally, very much prefer to send every one who wants brandy or whisky to a store where spirits are regularly sold, and so would every member of the Committee on Revision, but as long as they are employed for medicinal purposes there must be some standard established by authority, that is to say, the pharmacopeia.

WM. THOMPSON, Washington, D. C.—As a pharmacist I am honest in this question. I am anxious, if possible, to leave the drug store no excuse for dealing in alcoholic liquors and selling brandy and whisky. As one means of preventing this abuse as far as possible I am anxious to see these two articles dropped from the pharmacopeia. It is not for the profession of pharmacy or for the pharmacist to say that these articles are worthless. Spiritus vini gallici, spiritus frumenti, vinum rubrum and album, we have just been told, are valuable only for the alcohol they contain, and this has been my own opinion for a long time. I am glad to have the authority of Dr. Davis for the statement that the physician, when he desires to prescribe any of these articles, may get the same effect from the use of dilute alcohol. Moreover, when he orders alcohol diluted with clean water the physician knows just what quantity of pure alcohol the patient is getting, but when he gives spiritus vini gallici and spiritus frumenti he gives an uncertain quantity of alcohol, combined with certain ingredients which are added to make the preparation palatable, and there is danger of creating an appetite in the patient for these alcoholic drinks. This danger does not attend the use of dilute alcohol because it is not palatable. I do not agree with Professor Remington that it is necessary to have them in the pharmacopeia so as to establish some standard of purity; if they are not to be used in the treatment of the sick they should not be in the pharmacopeia. As to the difference between brandy and whisky, if the patient is not a connoisseur and experienced in the matter, he can not tell the difference by any chemic means. As regards vinum album and rubrum, the small amount of alcohol could be supplied by using dilute alcohol, and by using this the preparation could be made just as well as they could from the use of vinum album or rubrum.

Dr. J. V. SHOEMAKER—I fear that I can add nothing to the very full consideration of physiologic action and the practical recommendations which Professor Davis has given with regard to the use of alcohol and the elimination of wines and spirits from the pharmacopeia. Some years ago, while I was writing on the subject of alcohol and endeavoring to describe the differences between brandy and whisky and the different wines, I sought information from a gentleman who was employed in one of the large manufacturing establishments and he told me that if he had given to him a certain amount of alcohol and certain flavoring ingredients and coloring materials he would make a most perfect brandy or whisky, the most perfect white wine and red wine the most expert gourmet would want to taste. Now, as thus distinctly formulated and as already stated by the distinguished speaker, we are pouring into our patients certain extracts and flavoring substances in order to get the action of the alcohol. Many years ago I adopted the use of alcohol in the dilute form as a substitute for the officinal spirits and was satisfied with the results. As one of the humble laborers in this Section, I add my voice to that of Dr. Davis in favor of dropping the spirits and wines from the pharmacopeia and to make alcohol alone the officinal preparation.

Dr. KEEN, Pittsburg—It is a fact that perhaps 75 per cent. of all practitioners of medicine in the United States will continue to use whisky in their practice during the next ten years, whether the pharmacopeia recognizes it or not. Professor Remington, on behalf of the pharmacopeia committee, stated that no drug that is used so commonly as is whisky could be dropped from the pharmacopeia. He also stated, and I agree with him, that there should be some standard of purity for articles that are used in medicine. I therefore think that whisky should not be taken from the pharmacopeia. I believe that whisky is capable of doing good; I have seen life saved by it. It is no reason that it should be thrown out of the pharmacopeia because it may be abused. We might as well throw out opium or morphin because some people form an opium or a morphin habit. In my opinion the opium habit is a greater curse to society than the alcohol habit. To drop whiskey from the pharmacopeia would do no good. It would still be prescribed by physicians and there would then be no standard of quality or of therapeutic activity. That is the question in my mind.

Dr. ECCLES—Dr. Keen has just informed us of his knowledge that life has been saved by the use of whisky, and that 75 per cent. of professional men would use whisky during the next ten years whether the pharmacopeia recognize it or not. I do not know whether or not whisky, as such, is much prescribed throughout the United States, but in the section of New York in which I am situated the druggists will scarcely receive one prescription for whisky in twelve months, and this is the general experience of pharmacists in my neighborhood. If this is then the case, that whisky is so frequently prescribed in Pittsburg, where Dr. Keen comes from, it is a very remarkable state of affairs. Professor Remington has stated that it would be necessary to retain the officinal wines. I believe that there is no value to be obtained from the wines which we can not get as readily from dilute alcohol. It may be objected that the preparations made with alcohol would not be so palatable, but as Dr. Shoemaker has told us that in nine cases out of ten even experts may not be able to distinguish the prepared wines from the pure article, it is evident that the palatability is due to flavoring ingredients, which may be added, if desired, to the dilute alcohol. The impression is becoming general that the druggist's is not the right place from which to get brandy or whisky, but the applicant should go to the liquor store. The liquor dealer can afford to sell liquors cheaper in small quantities, and druggists should direct their patrons to the liquor store for brandy or whisky, and in this way he does not promote in any way the abuse of these articles by the public. Professor Remington has stated that if they were dropped from the pharmacopeia there would be no standard of purity, but other articles are constantly prescribed which are not in the pharmacopeia; antipyrin, for instance, and other drugs of the coal-tar series. The tendency of evolution is to go to the active principle of remedies, as the vegetable alkaloids, and why should we not do this in the case of whisky? We no longer prescribe opium, cinchona and other crude drugs, but use morphin, codein and quinin or cinchonin. The alcoholic drinks are used principally for the alcohol. The drug stores are loaded up with wines of coca and other wines not in the pharmacopeia. I am very much in favor of making those of alcohol pure and simple. I can not go as far as Dr. Davis does, in believing that alcohol is not destroyed in the system. I believe that there are temperance reformers who use alcohol every day. I believe that it is formed in the process of digestion in the intestinal tract. I do not wish to be misunderstood. I would not prescribe alcohol when it is not needed simply because it is formed in the intestinal tract, any more than I would prescribe pepsin where it was not required, which is also found in the alimentary canal.

Dr. C. C. FITE—I would say to the members of the Committee on Revision, that the further they go away from the physicians' prescriptions in the pharmacopeia, the farther the physicians will go away from the pharmacopeia.

Dr. KING—I would like to reply to Dr. Eccles' statement that Pittsburg has a very remarkable state of affairs, and to say that I am led to believe that the physicians in Brooklyn have very little faith in their druggists. Now we do believe in our pharmacist and send to him for all our drugs, including whisky and brandy. I never prescribe antipyrin or any other article which is not in the pharmacopeia.

Dr. F. E. STEWART—On behalf of the delegates from the American Pharmaceutical Association, I desire at this time to offer the following:

WHEREAS, The medicinal properties of spiritus frumenti and spiritus vini gallici are due solely to the alcohol they contain; and alcoholic stimulation can be better achieved by the use of pure alcohol properly diluted and with less danger of the patient acquiring an alcoholic appetite, than by administering either of the above-named beverages; it is, therefore

Resolved, That the Section on Materia Medica, Pharmacy and Therapeutics of the AMERICAN MEDICAL ASSOCIATION recommends that spiritus frumenti and spiritus vini gallici be dropped from the United States Pharmacopeia in its next revision.

This was adopted by the Section.

Dr. DAVIS—I hope that I made it plain that I raised no question in the paper as to the value of alcohol as a medicine. I simply spoke of its physiologic properties and spoke of the desirability, for those who wish to use it, using it in its purity and knowing exactly what they are using. I made no question as to whether life is saved or life is destroyed; no question whatever. There are thousands of druggists who do not wish to be classed with liquor dealers, and would like to put it out of their shops.

V 29
1897

FURTHER DISCUSSION.

Discussion on the Subjects Referred to the Section on Materia Medica, by the American Pharmaceutical Association.

Dismissal from the United States Pharmacopeia of spiritus frumenti, spiritus vini gallici, vinum album and vinum rubrum; replacement of officinal wines by vinegars; dismissal of all tinctures having a fluid extract of the same drug officinal; substitution for such tinctures and fluid extracts of a 50 per cent. tincture under a distinctive title; change of formula for Dover's powders back to that of the 1890 United States Pharmacopeia, by using potassium sulphate in place of sugar of milk.

Professor REMINGTON—I have very decided views on these subjects of dismissal of spiritus frumenti and vina from the pharmacopeia and the replacement of officinal wines by vinegars, and I think that in both cases they are in the negative. The former subject has been considered and, as regards the latter, while I believe that the vinegars are useful and that the class could be increased with advantage, yet as regards the substitution of vinegars for the officinal wines, I do not think it can be done. For instance, the wines of ergot, of iron, of antimony, are very largely used in the United States, and the great objection to the dismissal of agents which are in use by physicians is that we thereby increase the number of drugs used over which we have no control. I therefore think that there can be no ground for the dismissal of the wines from the pharmacopeia. In the proposed dismissal of tinctures and fluid extracts we have the same difficulty before us. Physicians will continue to prescribe tinctures. We have supplanted a good many by fluid extracts, but physicians do not use them; for instance, digitalis. We have supplied for thirty years a fluid extract, but physicians have not yet abandoned the use of the tincture. Then again, there is the objection of the difference in the strength of the proposed 50 per cent. tincture and also in the menstruum. We now have dilute alcoholic preparations in the tinctures, strong wines and fluid extracts, and this proposed change would add another. If the doctor wishes to get the full action of all the active principles of a drug he would order the tincture, because the menstruum used in the tincture extracts more than other menstrua, because by adding water to some of the tinctures you will have a precipitation and the solution loses some of its effects.

With regard to the distinctive title of these proposed preparations. The question in regard to the fluid extracts has been before the Committee on Revision for thirty-five years. The tendency is to increase the strength so as to make them conform to the standard of one grain to the minim; rather than to reduce it. The fact of making the fluid extract weaker would open the door to sending out fluid extracts of half strength. The question came up before the Committee on Revision in 1880 and again in 1890, and has been referred to a subcommittee to work on. It was also discussed at the last meeting of the American Pharmaceutical Association. With regard to the substitution of sugar of milk for the potassium sulphate in Dover's powder, which was first suggested by Dr. Piffard, and the proposition to change it again, I think that the old method is the better one, and would approve the change. This subject was fully considered by Mr. Kebler in the June issue of the *Druggists' Circular*.

Dr. C. C. FITE moved that the Section does not concur in any of the above suggestions sent to it by the American Pharmaceutical Association, except in that with regard to Dover's powder. This was unanimously adopted.

ANTITUBERCULIN.

Presented in the Section on Practice of Medicine, at the Forty-eighth Annual Meeting of the American Medical Association, at Philadelphia, Pa., June 1-4, 1897.

BY JOSEPH McFARLAND, M.D.

PHILADELPHIA, PA.

The enthusiastic reception of the "Blutserumtherapie" led many of our esteemed colleagues to entertain the most ardent expectations of miraculous results in all divisions of the field of infective diseases. The constantly increasing number of recoveries from diphtheria that were reported and the occasional recoveries from tetanus that were hurried into print, convinced large numbers of professional, as well as lay men, that "Blutserumtherapie" led to an almost unlimited field of usefulness.

In those early days, I was frequently asked what the chances of serum treatment were likely to be and why I did not hasten to occupy that field and be among the first to benefit mankind with that much-needed boon, a "cure for consumption.". My answers to these inquiries were received with incredulous looks, and my endeavors to show why serum therapy for tuberculosis was likely to fail in the majority of cases, were unheeded. It was only after several years had rolled by and I had been almost forced into the field, that I at last consented to undertake the experimental research in which a number of the gentlemen present have so kindly aided me.

In order to make clear my grounds for hesitation and my convictions that the experiments would fail, I beg your indulgence in a brief résumé of the pathology of tuberculosis: Tuberculosis is primarily an inflammatory process. Every tubercle begins its history as a single inflammatory node, not very different from those produced by the introduction of foreign particles into the tissues. In the early stages of the disease there is rarely any marked systemic involvement, and many cases progress to the considerable destruction of organs before constitutional symptoms are observed.

Up to a certain stage, therefore, tuberculosis is not essentially different from any ordinary or non-specific focal inflammation. It is as the disease progresses that the difference is observed, for as the cause of the disease is alive and engaged in growing and propagating its kind, there is a progressive tendency for the disease-producers to disseminate and new inflammatory foci to form, and as growth means metabolism, there are waste products of the growth to be absorbed and eliminated. This is by no means all of the pathology of the disease. The tubercles develop at the expense of the organs whose tissues transformed into or replaced by the tuberculous tissue, are unable to perform their functions, or do so so insufficiently that disease must result from their incomplete action.

Lastly, the tuberculous nodes in which no blood vessels are formed, constantly soften and disintegrate with the frequent formation of holes or cavities in the tissues, in which, if they communicate with the outer air, saprophytic bacteria are likely to grow and add the harmless or oftener harmful results of their metabolism to the blood.

Tuberculosis is thus a progressive, distributive and in most cases, essentially chronic disease, from which death is more often the result of the destruction of organs, suspension of vital functions from local lesions, and profound secondary anemia, than from any poisonous principle in or produced by the bacillus. Viewed from such a standpoint, and this is the standpoint I always took in the early days of serum therapy, what could any antitubercle serum do? Could it reinstate disorganized organs? Could it prevent secondary infection? Could it prevent the dissemination of the bacilli in the organs or could it probably kill the bacilli already in the body? The last two questions are admittedly possibilities, and to them a third possibility might be added, the serum might excite the normal vital resistance of the animal body so as to enable it to dispose of the bacillus by phagocytosis or its bactericidal humors and so render it harmless. These seemed to be the possibilities, but the insurmountable difficulty seemed yet to come. What would an antitubercle serum be? How could it be made.

Clinician.	Age and sex.	Occupation.	Stage of Disease.	Condition on beginning treatment.	Duration of treatment.	Dose.	Reaction.	Result.	Remarks.
Ed. S. Reynolds and J. C. Welch.	F.	. . . . .	Advanced.	. . . . .	About a month.	5 to 100 m. daily.	Cramps in the lumbar and gluteal muscles and much pain.	Cough and expectoration diminished.	Patient died. "There were no results to encourage the use of the serum."
Ed. S. Reynolds and J. C. Welch.	M. 27.	. . . . .	Advanced; 7 years old; confined to bed when treatment was begun. Had been housed for months.	Weight 120; hectic; temperature 97–100½° F.; cough moderate but troublesome at night; marked physical signs; night sweats; diarrhea.	Six or eight weeks.	. . . .	Urticaria in every part of the body, one attack only. No repetition or other bad symptoms.	Night sweats ceased; cough improved; temperature was reduced in two weeks to 98.6–99; diarrhea ceased; appetite improved; weight increased to 125; became able to walk out to a distance of a half mile; pulse and respiration became normal.	The serum has done wonders." Dr. Reynolds feels that it will effect a cure in this case.
James M. Anders.	. . . . .	. . . . .	First stage.	. . . . .	Short.	. . . .	. . . . .	None given.	Encouraging success.
M. R. Ward	. . . . .	. . . . .	Third stage.	Temperature 102–103° F.; pulse 115–120.	Three weeks.	. . . .	None mentioned.	Temperature dropped to 100–101; pulse subsided to 96–105; appetite improved.	Patient became worse when the treatment had to be suspended because the supply failed. Two cases treated with Paquin's serum recovered. This case seems to have recovered. Dr. Hinsdale promises to make a future report of the case. Concludes that while the serum did no good it certainly did no harm.
Guy Hinsdale. . .	F. 27.	Married; housekeeper.	One year old.	Weight 120 pounds; cough and night sweats; physical signs marked; many tubercle bacilli.	Four months.	5 to 40 m.	None noted.	Weight increased to 127; bacilli disappeared; all physical signs disappeared except slightly increased vocal resonance over the right apex.	
A. A. Eshner . . .	F. adult	Married.	Probably three years old.	Cough; loss of weight; impaired appetite and digestion; constipation; weight 138.	Nearly three months.	1 to 2 c.c.	None noted; there was some discomfort, no pain following the injections.	Temperature was not altered, as it had not been elevated; no distinct effect on pulse or respiration; body weight increased to 142; appetite and color of skin improved; chilliness ceased after beginning the injections; physical signs did not improve.	Seems to have done good.
J. S. Cohen.	F. 23.	Married; three children.	Probably four years old.	Night sweats, cough and expectoration; weight 120 pounds; marked physical signs; tubercle bacilli in sputum.	Jan. 9 to Feb. 14; recovered after three weeks.	. . . .	. . . . .	Cough lessened during treatment, became worse when treatment ceased; when treatment began again some favorable signs observed. Patient was discharged from the hospital April 1, 1897, weighing 142 pounds.	Seems to have done harm.
J. S. Cohen	F. 21.	Single.	Four months.	Cough troublesome; t. b. in sputum; marked physical signs.	Began Jan. 10 to Feb. 12, '97.	. . . .	Urine decreased markedly in amount and showed traces of albumin.	Strength and appetite decreased; when the treatment was stopped patient improved.	
T. V. Crandall . .	F. 26.	Secretary.	Since Oct. 10, 1895	Pulse rapid; temperature 103; expectoration of blood and pus followed by cavity formation; cough constant; expectoration 63 in twenty-four hours; tubercle bacilli.	Began June 6, 1896, with Paquin's, concluded with Mulford's.	Up to 30 m. daily.	Urticaria.	Appetite and nutrition improved; gained nine pounds in weight; temperature reduced to 98° in the day and 99° at night; tubercle bacilli diminished, possibly disappeared; was able to resume her occupation.	Dr. Crandall does not think that in 30 years' experience with tuberculosis that he did as well with the "time being" treatment as with the antituberculin. There seems to be little doubt about the beneficial effect of antituberculin upon this case.
H. G. M. Kollock. .	M. 43.	Engineer.	Patient had been confined to bed for 6 months and was in the last stage of phthisis. There was a small cavity; tubercle bacilli in sputum.	. . . . .	Eight weeks; 25 m. daily.	. . . .	Urticaria.	Began to mend on the third day; by April 7 was able to go out, and in a short time was able to resume work; gained six pounds in weight; appetite enormous; physical signs are improved, only a small area of dulness remaining; bacilli have not disappeared; he is now able to perform his ordinary duties.	
J. C. Wilson and Dr. Kalteyer . .	M. 29.	Paper hanger; good family history.	Duration six months.	Weight 122 pounds; dry cough; scanty expectoration; night sweats; good appetite; pulse 80-100; temp. 98–100° F.; no cavities; bacilli.	Twenty-four injections.	1 to 10c.c.	Much urticaria and swelling.	Temp. more regular, slight decrease in pulse; weight reduced to 127 pounds; physical signs became worse; bacilli.	No result.
J. C. Wilson and Dr. Kalteyer . .	M. 33.	Shoemaker; good family history; operated upon eight times for enlarged lymphatic glands.	One and one-half years.	Weight 122 pounds; loose cough, worse at night.	Twenty-five injections.	1 to 10c.c.	Much urticaria, swelling, pain and occasional chilliness.	Conditions did not improve; patient decreased in weight.	No result.
J. C. Wilson and Dr. Kalteyer . .	M. 45.	Shoe factor.	One month.	Weight 112 pounds; dry cough; some night sweats; temp. 97–103°; hectic; bad physical signs.	Twenty-seven injections.	1 to 10c.c.	Very slight urticaria, slight chilliness and drowsiness after injections.	Temperature was more regular; loss of weight; expectoration increased.	Patient became worse during the treatment.
J. C. Wilson and Dr. Kalteyer . .	M. 36.	Brewer.	Three months.	Weight 113 pounds; loose cough; much expectoration; sweats every night; high fever; hectic; 98–104 1-5° F.; bad physical signs.	Twenty injections.	Rapidly increas'd to 10 c.c.	No bad symptoms.	Temperature became more irregular and hectic; pulse increased.	Patient died.
J. C. Wilson and Dr. Kalteyer . .	M. 53.	Electrician.	Seven years.	Weight 113½; dry cough; night sweats; vomiting; temperature 97–100 2-5° F.; bad physical signs.	Twenty-three injections.	1 to 10c.c.	Much urticaria; was unable to sleep.	No good followed the injections.	No result.
J. C. Wilson and Dr. Kalteyer . .	M. 23.	Leather worker.	Nine months.	Weight 123 pounds; slight cough; night sweats; temp. 97–103° F.; no cavities, but bad physical signs.	Twenty-four injections.	1 to 10c.c.	Much urticaria and chilliness.	Patient did not improve or become worse.	No result.

Of course, one's mind naturally turned to *tuberculin* as that which was to be the means of securing the desired end, but in tuberculin the desired and necessary means did not seem to be present. Tuberculin bears in no respect the same relation to tuberculosis that diphtheria and tetanus toxins bear to their respective diseases. Tuberculin is not a toxin, and large doses injected into healthy animals fail to produce symptoms in any manner analogous to tuberculosis, or in fact, any serious symptoms at all. In all the diseases successfully combatted by antitoxins there are distinct toxins, productive, when injected into animals, of the essential symptoms of the disease.

The fact, however, that tuberculin when injected into tuberculous animals produces a marked febrile reaction and in sufficient doses, death, is one that must not be overlooked and one from which the conclusion that "antituberculin" could do good was drawn. The idea of tuberculin was not a new one. Not to go into the history of the subject, let me say that it was first investigated by Viquerat and that Paquin has written numerous papers upon the subject and claimed remarkable results from it. I could not see, when I read Paquin's papers, nor do I yet see any reasoning from which it could be inferred that *antituberculin* can be in itself curative, yet both with Paquin's and with my own antituberculin, cures seem to have been effected.

I am of the opinion that the systemic symptoms of tuberculosis and the local distribution of the bacilli are favored by tuberculin or some similar substance in the blood of the animal and the effect it exerts upon the tuberculous tissue. This opinion is in conformity with the results obtained by the injection of small doses of tuberculin into diseased animals. It is not impossible that the hectic of early cases which can not be attributed to secondary infections, may be due to the periodic reaction of the organism to tuberculin produced in its own body.

If it should be demonstrated that when tuberculin is injected into an animal it is either changed into an antituberculin or stimulates the cells of the animal to produce an antituberculin, or in any way effects the origin of an antagonistic substance or an antidotal substance, it would be quite proper to conclude that such a substance would be of benefit, when injected into tuberculous animals, by suspending those effects directly traceable to the tuberculin itself.

To determine the existence of such an antidotal substance in the blood of an immunized (or accustomed) animal is, however, attended with the greatest difficulty, for only upon tuberculous animals can the effects of tuberculin be shown, and only upon such animals can the combined effects of tuberculin and antituberculin be shown.

The method employed for the preparation of the antituberculin is too much in the ordinary path of serum therapy to need any lengthy description. The ass was the animal chosen. After preliminary examination, at the hands of the veterinarian, for good general health and freedom from glanders, the animal was subjected to a systematic series of graduated injections increasing from 1 to 150 c.c. About a month after the last injection the first bleeding was taken and upon testing was found to be free from tuberculin. The serum of the ass is unfortunately of a peculiar grayish color and is never quite clear, so that the preparation is never a satisfactory one to look at.

We have preserved the serum by the addition of 0.5 per cent. of trikresol, after which it is filtered through diatomaceous earth. In the beginning there was no theory upon which the dose could be regulated. I advised, however, that the beginning dose be 1 c.c. Soon this dose was found by the majority of the clinicians to be too large and to cause much pain in the wound, in the joints and in the back. The dosage in the reported cases varied, however, from .5 to 10 c.c. at an injection.

Supposing that the "antituberculin' was to be efficacious in the treatment of tuberculosis, what action shall we expect from it? From the premises given we may conclude:

1. If the fever be the result of tuberculin poisoning it will reduce the temperature.

2. If the rapidity of the pulse depend either upon the fever or the poison the antituberculin, by annulling the effect of the tuberculin and by relieving the fever, will slow the pulse.

3. If the spread of the disease depend in part upon the destruction of tuberculous tissue by the specific action of tuberculin and the liberation of the bacilli from it, that reaction will not take place, the tissue will not be destroyed and the bacilli will be held within bounds.

4. If the retention of the tubercle bacillus in the already diseased tissue will enable the changes in the surrounding healthy tissue to encapsulate it, and if the retention of the temperature and pulse will aid in the temporary or permanent improvement of the general condition of the patient, the antituberculin may be a means toward the production of a cure.

In what way the clinical use of the remedy thus far will bear out these theoretic considerations the accompanying analysis of cases will show.

Having thus secured a serum and a theory under which it might be a useful one, the difficulty was only met not surmounted. The proof of usefulness was yet to be demonstrated.

The first test to which the "antituberculin" was subjected was that of curing tuberculosis in guinea pigs.

1. Series 1 and 3.—Twelve guinea pigs were inoculated with tubercular sputum and then subjected to a routine of frequent subcutaneous injections of antituberculin, beginning with 0.01 c.c., and in the course of twenty-five injections, extending over a period of five months, increasing to 2.0 c.c. These guinea pigs died at varying periods from eleven (probably not from tuberculosis but from some other microörganism in the sputum) to 213 days. Excepting the first, all the animals had pronounced tuberculous lesions.

2. Series 2 and 4.—Together with these tests twelve other guinea pigs were inoculated with tuberculous sputum and subjected to no treatment. Of these one is still living, all the others died in less than 127 days.

From these experiments I felt pretty well satisfied that the antituberculin would not cure tuberculosis in guinea pigs. It next remained to see whether or not it would produce immunity to the disease in guinea pigs.

3. Series 5.—Six healthy guinea pigs were subjected to the same course of antituberculin injections as are described in experiment 1. At the end of the five months these animals all being well and strong and having gained weight regularly, were inoculated with pure cultures of the tubercle bacillus. At the present time they all show signs of tuberculosis. While small in numbers, the second experiment invited no repetition. From it I feel that we can safely conclude: 1, that the antituberculin in large doses is without injurious effect upon healthy guinea pigs; 2, that it does not immunize guinea pigs against tuberculosis.

To determine whether large doses administered to healthy guinea pigs not previously accustomed to it would be injurious:

4. Series 10.—Three healthy adult guinea pigs were each given 1 c.c. of the serum. No symptoms were observed.

I suppose all medical men are now acquainted with the action of tuberculin upon tuberculous animals, to the extent that when small doses are administered a febrile reaction is manifested, and when large doses are given, death results. My last guinea pig experiments were conducted with a view to determining whether it would be possible to destroy the activity of tuberculin upon diseased (tuberculous) guinea pigs by combining the tuberculin with the antituberculin.

The fatal dose of tuberculin is quite inexact and varies with the stage of the disease, which in its turn varies with the susceptibility of the individual. The tuberculin with which I worked was of such strength that 1 c.c. of it was fatal for an average guinea pig tuberculous beyond four or six weeks. The same dose was harmless for healthy guinea pigs.

5. Series 7.—Three tuberculous guinea pigs inoculated with 1 c.c., 1.5 c.c. and 2.0 c.c., respectively, died in twenty four hours.

Series 1.—Guinea pigs inoculated with tuberculosis Oct. 21, 1896, and injected with the serum of an immunized animal as follows:

Date.	Dose, c.c.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.
Oct. 27, 1896	0.01	Died April 24, 1897; 218 days.	Died; 80 days.	Died; 48 days.	Died; 46 days.	Died; 11 days.	Died; 12 days.
Oct. 28, 1896	0.01						
Nov. 30, 1896	0.01						
Dec. 2, 1896	0.02						
Dec. 3, 1896	0.02						
Dec. 4, 1896	0.02						
Dec. 5, 1896	0.02						
Dec. 7, 1896	0.05						
Dec. 10, 1896	0.05						
Dec. 12, 1896	0.05						
Dec. 15, 1896	0.05						
Dec. 17, 1896	0.1						
Dec. 18, 1896	0.2						
Dec. 30, 1896	0.2						
Dec. 31, 1896	0.2						
Jan. 5, 1897	0.5						
Jan. 9, 1897	0.5						
Jan. 12, 1897	1.0						
Jan. 18, 1897	1.0						
Jan. 24, 1897	1.25						
Jan. 26, 1897	1.5						
Feb. 1, 1897	2.0						
Feb. 8, 1897	2.0						
Feb. 10, 1897	2.0						
Feb. 13, 1897	2.0						
Mar. 23, 1897	2.0						

Series 2.—Control animals injected with tuberculosis and not treated with the serum as above. These animals were six in number and were not frequently observed. The last of them died of tuberculosis Feb. 28, 1897, so that none lived longer than about 127 days.

Series 3.—Six guinea pigs inoculated with tuberculosis Nov. 28, 1896, and injected with the immunized serum as follows:

Date.	Dose, c.c.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.
Nov. 26, 1896	0.01	Died Feb. 8, 1897.	Died Dec. 5, 1896.	Killed Jan. 5, 1897.	Died Feb. 8, 1897.	Died Feb. 10, 1897.	Died Jan. 5, 1897.
Nov. 28, 1896	0.01						
Nov. 30, 1896	0.01						
Dec. 2, 1896	0.02						
Dec. 3, 1896	0.02						
Dec. 5, 1896	0.02						
Dec. 7, 1896	0.05						
Dec. 10, 1896	0.05						
Dec. 12, 1896	0.05						
Dec. 15, 1896	0.05						
Dec. 28, 1896	0.1						
Dec. 30, 1896	0.2						
Dec. 31, 1896	0.2						
Jan. 5, 1897	0.5						
Jan. 9, 1897	0.5						
Jan. 12, 1897	1.0						
Jan. 18, 1897	1.0						
Jan. 24, 1897	1.25						
Jan. 26, 1897	1.5						
Feb. 1, 1897	2.0						
Feb. 3, 1897	2.0						
Feb. 8, 1897							
Feb. 10, 1897							
Feb. 13, 1897							

Series 4.—Six control guinea pigs inoculated on the same day were not frequently examined. On March 6, 1897, only one remained, which is still living, June 1, 1897.

Series 5.—Six guinea pigs in good health were subjected to the same injections as Series 1 and 3. After a long rest they were all inoculated April 7, 1897, with tuberculosis. One died May 20, 1897, another May 8, 1897. The remaining animals

Series 6.—Two healthy non-immunized guinea pigs were also inoculated with pure cultures of the tubercle bacillus on the same day. One of them died May 24, 1897, the other is still living with advanced tuberculosis.

Series 7.—Six guinea pigs were inoculated with tuberculosis Jan. 28, 1897 (sputum). In March there remained three animals of this series, all with well-developed tuberculosis. They were injected March 22, 1897, with 1, 1.5 and 2 c.c. of tuberculin. All died in twenty four hours.

Series 8.—Five guinea pigs inoculated with tuberculosis Feb. 13, 1897, survived until March 31, 1897. Each was given a fatal dose of tuberculin with respectively 0.5, 0.5 and 1.0 c.c. of the antitubercle serum. The first survived until April 15, 1897, the second until April 1, 1897, the third until April 15, 1897.

Series 9.—Six guinea pigs with advanced tuberculosis were given each a fatal dose of tuberculin and varying quantities of serum from 0.5 to 2 c.c. All died within twenty-four hours.

Series 10.—Three healthy guinea pigs each received 1 c.c. of the serum used in the above experiments: no results.

Series 11.—Three healthy guinea pigs received varying quantities of the tuberculin used above, 1 to 2 c.c.: no results.

Series 11.—Three healthy guinea pigs injected with 1 c.c. and 2 c.c. of the same tuberculin showed no symptoms.

6. Series 8.—Five guinea pigs inoculated with tuberculosis Feb. 13, 1897. Three survived until March 31, 1897, when each was given a fatal dose of tuberculin and varying quantities of antituberculin from 0.5 to 2.0 c.c. The first survived until April 15, 1897, the second until April 1, 1897, a third until April 15, 1897. In this experiment the rapidly fatal issue of the tuberculin injections seemed to be suspended as if the tuberculin had been neutralized. The outlook was now so interesting that the experiment was repeated.

7. Series 9.—Six guinea pigs with advanced tuberculosis were each given a fatal dose of tuberculin and varying quantities of the antituberculin. All were dead within twenty-four hours. This experiment seemed to destroy the results of the one before it, but the exact problem is a difficult one, for these cases may have been a little more advanced than the others, when less tuberculin would kill them; or the particular bacillus they received may have been a little more virulent, when the disease would have progressed more rapidly.

Thus far, therefore, I have been unable to prove that antituberculin neutralizes or in any way affects tuberculin in its action upon tuberculous guinea pigs. The sacrifice of my fifty or more guinea pigs seems to have been without result.

In all experiments upon animals, however, one must not forget that man is not a laboratory animal, and that he differs from them in his susceptibility. The guinea pig is an animal so susceptible to tuberculosis that it rarely if ever recovers after inoculation. Man not infrequently recovers and almost always suffers from a chronic form unknown to the guinea pig. The question now arose whether one should content himself with the results of guinea pig experiments or whether the experiment should be tried on man. Through the kindness of a number of gentlemen, I am able to lay before you results of an analysis of about twenty cases in which the remedy has been systematically applied

I think it will be best for me to allow you to draw your own conclusions from the data given. To me it looks as if a definite improvement was obtained in some cases. A glance at the tables will show that the improvement consisted in amelioration of just those symptoms that the theoretic considerations had suggested. The temperature declined and became less hectic; the pulse slowed; the appetite and body weight increased and the cough became less violent. The disappearance of the tubercle bacilli is the most rare and least to be expected result of the use of the remedy.

It would be an egregious error not to speak of the ill effects that have been noted. I can not persuade myself that the death of the one case or the rapid decline of the two were in any manner attributable to the antituberculin which I believe to be harmless.

The most common ill is urticaria immediately following the injection, sometimes localized, sometimes general. This, I think, is due to the freshness of the serum, which was sent out almost as soon as bled.

Painful swellings at the seat of injection seem to be common and undesirable. They may be due to infection or may have some connection with the rapidity of the injection or to the character of tissue selected for the injection, or they may depend upon the freshness of the serum. They have been troublesome in many cases but have never, so far as I know, suppurated or done any damage.

Lastly, the opinion of those who have used the remedy seems to be that the dose should not exceed 1 c.c., at least for a long time. Excessive dosage seems to produce pain in the back, pain in the joints and pain in the wound.

In conclusion, I think we have in antituberculin a substance useful in the treatment of tuberculosis, in that it ameliorates certain symptoms seemingly associated with the toxic conditions present. While the exact value and action of the substance can not be proven by experiments upon guinea pigs, it seems to have been demonstrated clinically.

In closing this paper I must express my sincere thanks to Drs. J. C. Wilson and Kalteyer; Drs. James and T. Miller Tyson; Dr. H. G. M. Kollock; Dr. E. S. Reynolds and J. C. Welch; Dr. James M. Anders; Dr. M. R. Ward; Dr. Guy Hinsdale, Dr. A. A. Eshner, Drs. J. and S. Solis-Cohen, Dr. T. V. Crandall and others for their kind interest and aid in the investigation.

EIGHTEEN YEARS OF PERSONAL OBSERVATION OF TUBERCULOSIS IN ASHEVILLE, N. C.

Presented to the Section on Practice of Medicine, at the Forty-eighth Annual Meeting of the American Medical Association held at Philadelphia, June 1-4, 1897.

BY JOHN HEY WILLIAMS, A.M., M.D.
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In presenting this paper to your honorable body it is well to premise by stating that it is not my intention to exploit any new discovery or vaunt any new mode of treatment. I simply present deductions drawn from a personal observation of over two thousand cases, covering a period of eighteen years; during which time I have been more or less actively engaged in the general practice of medicine in Asheville, N. C., and with, perhaps, special opportunities for such observation.

My excuse for this paper is, that I believe that the profession at large has a deep interest in such observations, made by one of a fair amount of intelligence and a deep interest in his profession. It is too often true that with the specialist the "wish is father to the thought," and conclusions are reached long before the clinical facts will justify such conclusions. It is not my intention to burden this paper with futile speculations and reports of cases.

For the last thirty years or more, the plateau of western North Carolina, of which Asheville is the center, has been the Mecca toward which the faces of many of our afflicted have been turned.

Eighteen years ago I was myself an invalid, suffering from supposed pulmonary tuberculosis—I say supposed, having then no means of positive diagnosis. I was advised by such eminent authorities as Da Costa, Weir Mitchell and the lamented Pancoast that I could not live a year longer in Philadelphia and that a change of climate was necessary. My attention was drawn to western North Carolina by the writings of Hon. E. J. Aston, to whose memory I would that time and ability would permit a more fitting tribute, and the reports of Dr. J. W. Gleitsman, now of New York, who was then conducting a sanitarium for pulmonary diseases at Asheville. To his scientific observation is due much of our knowledge of the climatologic advantages of this spot. At that time Asheville boasted of but 1,700 people, thoroughly imbued with the old time southern hospitality, and pride in their beautiful country. A few months' residence there, and a more thorough knowledge of its climatic attributes, decided me that to obtain a perfect cure I should take up a more prolonged residence. I decided to remain five years at least. With passing years came confirmed health, and I have remained eighteen, with pleasure and profit. With returning health I devoted myself to the practice of medicine, but as time passed the increasing number of invalids who sought our hospitable doors caused my work to run more largely into the line of tubercular troubles. Prior to the tremendous discovery of Koch the treatment of such cases was in no manner specialized. Few if any notes were made of the treatment and progress of the cases. Systematic record of temperature, pulse and respiration was seldom made and it was not until after the discovery of the tubercle bacilli and the necessary association of their presence with the usual phenomena associated with consumption, as we now understand it, that a sharp interest was taken in such cases and the work of our confrères all over the world was closely scrutinized, and independent investigations set on foot with the hope that we might add something to our armamentarium. With greater precision in diagnosis due to improved aids and the closer attention of the profession at large, the earlier diagnosis of tuberculosis was possible.

The influence of climate in the therapy of the disease was given closer attention and its influence in the arrest and cure of the disease has been from time to time strongly set forth by all of our leading specialists, not only to the profession but to the laity as well. The influence of all this teaching is that yearly still larger numbers of primary cases are seeking the health-giving plateau of western North Carolina and western Kansas and Colorado. The ease of access—less than twenty-four hours from New York and only eighteen from the Ohio Valley, with its now well-known climatic advantages, has made this favored region the choice of most physicians of the North and East.

With a proper understanding of all that climate can do for such cases has come the full knowledge that climate is not all, and we have learned, too, that "change of climate" in part consists of a complete change in the environment of the patient, which is so large a factor in the health-restoring attributes of most of our health resorts. The freedom from business cares, household and social duties, is by no means to be underrated. Then comes, too, the change in all the nutritive surroundings of the patient; the bracing air, surcharged with ozone as shown by the meteorologic bureau, the cloudless skies and magnificent scenery, where external impressions count for so much, all conduce to an active out-door life. To such as can and will lead such a life, climate means much—those who can not and will not submit to the intelligent discretion of the painstaking physician and put off having a "good time," till the restoration of their health, had better stay at home. The result in such cases will bring discredit upon the remedy. The care and supervision of the physician whose intelligence and skill has been or should be vastly improved by the observation of the large number of cases that yearly pass in review before him, is necessary in regulating the daily details of the patient's life.

With the closer attention that has of late years been given to the prodromic signs of latent tuberculosis

comes an earlier removal from the environment of the patient with corresponding benefit.

In speaking of latent tuberculosis, I have had impressed on me the influence of heredity and a careful study of over 70 per cent. of my patients shows the hereditary taint. In this connection comes the thought of prophylaxis. I would strongly urge the propriety and even necessity of the family physician making regular and stated examinations of every member of the families who may be intrusted to his care, in whom there is even a remote suspicion of the hereditary taint. The importance of the early recognition of tuberculosis is being daily urged upon us—so much can be done in the earlier stages and so little in the later. Cases in the later stages of the disease, with large suppurative cavities, septic chills and fevers, amyloid degeneration of the kidneys, tubercular infection of the intestinal tract with diarrhea—any or all of these I have seen on their arrival in Asheville and have had to advise their immediate return—can have the pathway to the tomb made much smoother with the comforts of home.

The various treatments that have been exploited by their fond discoverers have all passed in kaleidoscopic review, Bergeon, superheated air, etc. Of the most of them it is unnecessary to speak. I have had an opportunity to observe all of them as well as to experiment with the various remedies that have found favor with the profession.

The grave disturbances of nutrition in all cases of tuberculosis, whether it be primary or secondary, is a matter of deep interest. It is a recognised fact that only through suitable changes in all the nutritive processes and surroundings of the patient can we hope to deal successfully with the profound cachexia of tuberculosis in any form.

Possessing no known specific, we have been led to experiment with any and all remedies, foods and physical surroundings that contribute in any way to the building up of the physical and vital forces. The gamut has been run in the way of chemic foods—so-called—but we have to admit that the chemic laboratory has not as yet furnished us with anything that can supplant nature in the catabolic and metabolic processes necessary to a stable equilibrium in the physical economy. Anything that will assist nature to resume a wholesome and healthy function of digestion and assimilation will prove to be a valuable addition to our armamentarium.

Intestinal antisepsis—thorough and complete as may be—appears to have first place in conducing to the nutrition of the patient. In this class of remedies creosote appears to have first rank. I have observed no special benefit from the inordinately large doses given by some. I have given it in doses of from 20 to 90 minims daily, but have decided that I get as good results from the smaller as from the larger doses.

Next to creosote, and I am sometimes of the opinion that it should come first, is the internal administration of ichthyol. I have used the remedy for the past eight years in daily doses of from 20 to 100 minims, and my case books show a very material modification of the symptoms in a large percentage of cases, especially marked in the earlier stages. Glandular cases and those showing evidence of gastric and duodenal catarrh come especially within the range of of its power. Since reading the remarkable results obtained by Scarpa I have had my faith in its powers much strengthened. In no one case have I noticed any unfavorable result from its usage, except an occasional bronzing of the skin, coming on about the third or fourth week of its exhibition and lasting a week or two. In a large percentage of the cases in which I have used it I have noticed a gradual involution and degeneration of the bacilli, with a reduction in number, and their final disappearance. The assimilation is improved and the patient takes on flesh; the character of the sputum is changed in a marked manner, loosing its heavy, viscid, nummular character and becoming thinner, with greater ease in expectoration. There is an improvement in the appetite and digestion with recession of the daily temperature and lessened night sweats.

The use of the pneumatic cabinet with forced inhalation of the vapors of creosote, oil of pine needles, oil of cedar and the various balsamic preparations finds great favor. The stimulation of the local circulation gives consequent freer oxygenation of the blood. The expansion of the bronchioles and vesicles helps to free them from retained mucus and gives a larger breathing capacity, and it counteracts the contraction of connective tissue from inflammatory deposits.

I think it is the general consensus of medical opinion that so-called intra-pulmonary medication, whether by sprays, vapor or steam baths, is, *per se*, of but little avail and that our best efforts should be directed to the restoration of the impaired nutrition and the stimulation of the leucocytes and phagocytes of the blood. If the theory of Metchnikoff be true, and it has not yet been discredited, the remedies that will stimulate this vital action will prove of best service to us.

In this connection I will mention my personal use of Koch lymph and later of the modified product of Klebs known as Antiphthisin.

I was an early user of Koch's tuberculin and was, as were most of us, enthusiastic over the promises of the future. Unfortunate results in some of my earlier cases, however, produced such revulsion of feeling that for months the remedy was allowed to fall into innocuous desuetude. More careful study, however, of the physiologic action of the remedy, with more favorable reports from observers at other points, induced me to give it further trial with careful precaution as to the initial dosage and thorough espionage of the patient for several hours after its administration. With care in its usage, I secured in a few cases some remarkably favorable results, but in the majority of cases confess to disappointment.

The advent of the serum therapy gave renewed interest in the investigations of Koch and Klebs. The modification of the remedy as proposed under the name of antiphthisin or purified tuberculin seemed to offer a safer remedy than the earlier product of Koch's laboratory and to admit of a more extended application. It has been, I think, proven by clinical observation and experience that in the earlier or prodromic stages the antiphthisin Klebs or the later product of Koch's laboratory may give almost marvelous results. My case books show that within the last two years I have had not less than thirty absolute and unequivocal recoveries under the administration of this remedy alone.

It is not within the province of this paper to discuss the physiologic action of this remedy. I am simply noting clinical results. I may, however, mention that I do not think that antiphthisin possesses

any bactericidal power as does the antitoxin of diphtheria but that it does produce in the body of the patient, by some catalytic power acting as a special ferment upon the healthy tissues of the body, that stimulation of phagocytosis that enables the patient to deal with the bacilli, producing if you please a personal antitoxin. With such specific treatment of the patient comes the general care of all the functions of the body. Septic chills and fevers are not to be controlled by quinin or the coal-tar products. The usage of these latter remedies has been generally discarded. The relaxed skin renders the patient more susceptible to the effect of the diurnal changes common to all elevated latitudes. The daily rise of temperature is best combated with perfect rest in bed with liquid food. With extreme temperature, I have gotten the best results from the use of the ice-bag over the precordium or cold packs to the chest. Oil of turpentine with subgallate of bismuth appears to give the best results in diarrheic cases—opiates are seldom required, save possibly in the form of codein to control cough. The large diurnal range of the thermometer renders the wearing of woolen or silk or other non-conducting material next to the skin imperative. The powerful and stimulating effect of a strychnia nitrate upon the vascular and respiratory centers makes it a valuable adjunct.

Hematic remedies, especially Gude's pepto-mangan, gives excellent results, epescially in cases of an anemic character and in those of a mixed infection. My experience in the Shurly-Gibbs treatment in sixty-four cases has been unsatisfactory in every respect. The Edson aseptolin has proven to be of service in about 14 per cent. of those cases that came to me with a history of malarial infection.

The ingestion of as large quantities of nitrogenous foods as can comfortably be taken care of by the digestive organs, the out-door life, the careful conservation of all the forces of the body will add much to that uncertain factor known as climate. In the selection of cases suitable for transfer to the plateau of western North Carolina I have a few words of caution to offer. Examine your cases carefully with all the aids that modern research has given us. A microscopic examination of the sputum will be of invaluable aid. Cases of mixed infection of the mesentery and the great eliminative organs are by far better off at home. The familiar surroundings, the faith and hope inspired by the old and trusted family physician, the thousand nameless comforts of home will prolong a possibly useful life that would succumb certainly and speedily under the depressing influence of absence from home and friends. Nostalgia is as important a factor in these as with our sick and wounded in the late war.

I have noticed but little effect upon the nervous system from our medium altitude, except that in most cases it has a distinctly soothing effect and that our visitors sleep better here than at home. Cases of a hemoptistic character are usually advised to try the lower altitudes of the eastern and southern slope of the Blue Ridge and I think that Tryon, in the western extremity of the famous Thermal Belt, is the ideal spot.

The financial condition of the patient should also be carefully considered, since to get the best results from climatic influences he should be provided with not only the necessaries but even the comforts and luxuries of life. Very little benefit can be obtained from such climate as can be obtained from a little back room in some second- or third-class boarding house. Let him keep away from the clubs and hotel lobbies and abstain from all the frivolities that are found in all well-known resorts. Do not advise him that the climate will do all for him that is necessary. Advise him by all means to consult on his arrival one who is familiar with all the various things that will conduce to his well being and capable of advising against the dangers that may result from a total change in his habits and surroundings. You will find more than one physician at all such resorts and it is presumable that they are as honest as the general run of the profession.

I would sugggest that you submit your observation of the patient, with history of prior treatment to the physician to whom you may intrust him, noting the remedies which you have found of special benefit, and any peculiarity of temperament or habit with which you may be acquainted. Above all be honest with your patient. It is not kindness to tell him that he has a little bronchial trouble, just a little catarrh or something of that sort, and that a few days' sojourn in a pleasant climate will set him all right. Tell him why you send him and the necessity of devoting all his time and energy to getting well. Tell him the truth.

53 Haywood Street.

DR. DeLANCEY ROCHESTER'S "REPORT ON THE TREATMENT OF PULMONARY TUBERCULOSIS."—REPLY.

BY PAUL PAQUIN, M.D.
ST. LOUIS, MO.

Under the above caption appears in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, July 10, 1897, the report of Dr. DeLancey Rochester of Buffalo, N. Y., as presented to the Section on Practice of Medicine, at the Forty-eighth Annual Meeting of the AMERICAN MEDICAL ASSOCIATION, held at Philadelphia, June 1–4, 1897. This report I had the pleasure of hearing and was disappointed in not being able to discuss it, owing to the numerous other papers on tuberculosis presented before that and other Sections of the ASSOCIATION, and for the discussion of which only five minutes were granted to each member.

The report of Dr. Rochester seems to be a comparative statement of the results he obtained in the use of Edson's aseptolin, Paquin's tubercle antitoxin and Vaughan's nuclein. I have read it carefully and am compelled to reply because of the manifest injustice it does the cause of sero-therapy and myself. In order to present my case properly before the readers of the JOURNAL and the members of the AMERICAN MEDICAL ASSOCIATION, it is necessary for me to give a history of Dr. Rochester's tests of "Paquin's" serum, and for this purpose I will be obliged, much to my regret, to quote from his letters to me and from mine to him. I feel justified in doing this because Dr. Rochester in his conclusions, gained from such a meager experience, declares against Paquin's tubercle antitoxin in unmeasured terms, and because the language and tone throughout the report is one to discourage the profession from using serum, and to belittle the method of treatment, to class it with aseptolin, and to exalt, beyond reason, another therapeutic agent. Dr. Rochester's grounds are not tenable.

On Nov. 28, 1896, Dr. Rochester addressed the lab-

oratories bearing my name and made this statement: "I should like to compare Paquin's with Maragliano's serum." To this I replied, under date of Nov. 30, 1896, and made the following statement: " . . If you have more than a half dozen cases on hand at one time that you will treat for three months, or until the disease shall have disappeared, or until the patient shall have proven refractory to this method of treatment, we will make you the hospital reduction of 25 per cent., on condition that you will make careful examinations, charts and reports, as per enclosed blank,[1] you keeping a duplicate to assure yourself that we will not take advantage of anything favorable you may say and leave other results out. Furthermore, we would exact a microscopic examination of the sputum, not only with reference to the bacilli of tuberculosis, but also with reference to all pus germs, their kind and number; whether cavities exist or not, and the nature and degree of fever. You will understand that it is only on the grounds of a thorough diagnosis that sero-therapy can be intelligently applied in tuberculosis, and numerous reports have come to us of failures simply because the serum *was applied in absolutely hopeless cases*, or that a serum designed exclusively to act against the bacilli of tuberculosis *was used in cases of mixed infection* when a combined preparation against mixed infection should have been used. Any communication you may send me personally will be answered with pleasure, etc."

On Dec. 2, 1896, Dr. Rochester wrote me a long and pleasant letter, in which he makes this statement: "*I have none* (meaning no patients) in what may be truly called the incipient stages." In this letter Dr. Rochester also *objects* to sending the chart of his diagnosis, on blanks sent him by me, as mentioned above. To this letter of his I replied on December 4, and made the following statement: "My object in asking you to file your diagnosis and record with me is not for the purpose of publishing the same in our literature without your consent, but it is for my own guidance in experimentation, clinical work, and in our efforts to improve the serum. You will note by my previous letter that I mentioned the fact that some cases of mixed infection should be treated with serum *purposely prepared*, having for its object *the arrest* of the *various complicating germs* as well as the bacilli of tuberculosis. This is one of the reasons why we are so anxious to get the results of the microscopic analysis and a proper diagnosis, that we may supply the proper serum.

"In your cases you have a splendid opportunity of doing some good scientific work and I would respectfully suggest that you institute your work in such a way that you may be able to determine the results by the use of *pure* anti-tubercle serum and the *mixed* anti-tubercle and anti-streptococcus serum in pure and mixed cases of tubercular infection. For that purpose, I think the following mode would be practicable: I would first treat every patient with pure anti-tubercule serum, for several weeks, say a month or two, and note the results carefully. In all cases in which there is no imprvement, and in which mixed infection was discovered, I would then use the serum for mixed infection, which we would supply on demand, and note the result. By that means you could make a comparative report. You may, however, think best to start your work on a different basis, and that of course, is for you to decide.

"I thank you very much for your kind reference to my work in lecturing to your classes, but I beg to *warn the profession against too sanguine hopes in the use of serum in tuberculosis*, unless used in such cases where disintegration *has not advanced beyond repair*. It is true, we have on our list of recoveries, cases that seemed absolutely hopeless that had been given up by physicians of reputation and without question very competent, but these are exceptions and nothing should be left undone, in private practice at least, to sustain the action of serum by other methods. The digestive apparatus particularly needs careful attention and so does the nervous system.

"With reference to the business portion of our relations, I would beg you to correspond with the laboratories, as per enclosed card. Anything purely professional I will attend to with great pleasure, etc."

January 16, 1897, I received a note from Dr. Rochester saying that his patients had not done well but that he was "convinced he was working in the right direction." This I answered January 18, and made the following statement: "It is true that sometimes in desperate cases, sero-therapy succeeds in producing quite an improvement, and I have in my charge now patients in whom cavities seem to have dried up. But in a general sense one *need not expect much in advanced cases* of tuberculosis.

"On the other hand, it is well to consider that in almost every case of mixed infection it is the growth and products of the complicating germs that cause the great injury and eventually death. Chills and high fever, I am sure, are almost wholly due to these factors, and in such cases a serum prepared especially to meet these conditions is necessary. In all cases in which I find profuse quantities of mixed germs, besides the bacilli of tuberculosis, particularly when there is fever above 101, 101.5 or 102, and still more particularly when there occur rigors, and the expectoration is more or less profuse, I use a serum produced by the immunization of animals with the germs that complicate tuberculosis. I also in some instances mix the two serums, but in any event, the serum should be prepared according to the case. I have not yet put this serum on the market, but have been experimenting with it for some time and the results have been more gratifying than with the pure anti-tubercle serum, so that I would suggest that you make charts of your cases with reference to mixed infection and submit them to us, and from this I may be able to give you a serum that will prove more satisfactory.

"Further, I wish you to consider that tuberculous patients with *hereditary influences* are poor subjects for sero-therapy alone, seemingly because their general constitution, particularly the nervous system and digestion are very deficient, and the neutralization of the toxic products of the bacillus of tuberculosis and other germs is not followed by the arrest of the germs themselves and their growth, to a sufficient degree.

"I trust that you will give the serum *a fair trial* in all its forms, and I will be very glad to coöperate with you if you will permit me. I am anxious, in any event, *to know the nature of your cases*, and I think *it but fair* that you should kindly file with me a charted diagnosis of each, history, etc., on the blanks furnished you for that purpose. *My object in this is to guard against unjust criticism*, which I do

[1] This blank chart contains, on one side, cuts of the chest, back and front, and diagrams on which to note the nature and location of the physical signs and lesions; on the other side, blank form to write the history of the case, existing conditions, microscopic analysis, uranalysis, diagnosis, prognosis, etc.

V 2
189

not anticipate from you, but I think it fair that I should be prepared at any turn. Another object is to keep track of the cases the serum is used in by thinking men, to the end of advancing sero-therapy, in tuberculosis particularly. I believe that I begged you to send me these charts before."

February 13, Dr. Rochester wrote: "I have become convinced that the cases that present themselves at the County Hospital are *too far advanced for good results*, so have discontinued serum." In the same letter he says: "I was struck by *the fairness of your statements* at Baltimore and disgusted with the *unfair criticism* of a man from ———." I had been led to believe that with such feelings, Dr. Rochester could not himself be unfair.

I have other letters from both parties, from which I might quote to demonstate the absolutely legitimate and careful grounds on which I was attempting, through Dr. Rochester and at his request, as I have attempted with the assistance of many others whom I trusted, to improve sero-therapy in tuberculosis, at the same time taking step to protect myself and the work I was doing. It will be noticed from my letters to Dr. Rochester, that I specified repeatedly that little good could be expected from advanced cases of tuberculosis, and he himself acknowledged that the patients he had in hand were too far advanced, yet this is the very class of cases he chose in his attempts to demonstrate that Paquin's serum was painful and useless. Not only was the Doctor warned by letter, but the directions which accompany each bottle, and the literature on the subject from a number of physicians, all in good standing and splendidly equipped, demonstrate how the serum can be used with little or no pain, and the class of patients in which this method of treatment can be beneficial. He was advised that cases with cavities and other advanced conditions need not be considered favorable for serum treatment, and none of our reports claim more than a couple of cases of laryngeal tuberculosis (in which he deprecates serum) which were benefited materially.

Aside from these circumstances, I deem it unjust on the part of Dr. Rochester, to make a report comparing Paquin's serum with Edson's aseptolin rather than with Maragliano's serum, as he informed me he intended to do and for which purpose I sent the serum. I never knew he intended to compare sero-therapy with that justly discredited vagary known as aseptolin. I deem it unfair too that he should have chosen cases in which I claim little for serum, to minimize Paquin's serum.

I beg now to refer you to the cases he reports, as published in the JOURNAL, pages 69, 70 and 71, issue of July 10.

The first case in which he used serum had been on aseptolin from May 4 to December 1, 1896—seven months. Following are the chief points of diagnosis before beginning aseptolin: Case 1, D. M. (page 69 of the JOURNAL), "coughing and raising considerable . . . irregular chills followed by high fever and night sweats; . . . tubercular infiltration of right upper lobe." There was no cavity then. The Doctor claims that the patient improved and yet on December 12, when he began Paquin's serum (see page 70, first case) he declares that the following condition existed: "Infiltration in upper left; *cavity in upper right*." Thus a cavity had formed in the course of the seven months of breaking down during the aseptolin treatment. And yet, the Doctor used this case to make a comparative record of results between aesptolin, serum and nuclein. Was this scientific or reasonable or fair?

The second case, F. S., had also been experimented with. Aseptolin has been injected *six months* in this patient before beginning serum. The diagnosis' notes, May 4, 1896, before beginning aseptolin, (page 69 of the JOURNAL) give the following: "For six months the patient had gradually failed in health and strength; there was anorexia, anemia, marked cough, profuse expectoration, afternoon fever and profuse night sweats. Tubercular infiltration of upper and middle lobes of right lung." Now, on November 8, after the six months of aseptolin treatment Dr. Rochester declares that "there is infiltration of *entire* right lung, and *cavity* in left upper lobe surrounded by zone of breaking down lung; aseptolin stopped." The case had gotten much worse. December 14, just before beginning serum, this same aseptolin case was re-examined by Dr. Rochester and he describes his physical condition as follows: "Infiltration of left apex and of right upper, with bronchitis in right middle lobe." Mark that he no longer mentions the cavity, and thus the case appears milder to the readers. Is this scientific, fair or reasonable?

Case 3, of the serum series (p. 70, JOURNAL), is case four of the aseptolin series (p. 69). Before using aseptolin in him (for six months) he says, May 2, 1896, the patient is "anemic, has no appetite, feels very weak, suffers from dyspnea. There is evidence of consolidation of upper left lobe and scattered areas of broncho-pneumonia through rest of left lung, and slight bronchitis in upper right. Coughs a great deal, etc." Nothing is said in this diagnosis of a cavity existing. In fact, the very day the aseptolin was stopped, December 8, Dr. Rochester explains that there "was no change in patient's condition." And yet six days later before beginning serum he says: "There is an infiltration in the upper left and in the middle right and a cavity in the upper right." This undoubtedly is an acknowledgment that the patient has been going down hill with aseptolin, and still he considers it a patient to test serum. Is this reliable work?

Case 4 he describes as being with a *previous history;* infiltration of left upper lobe as far down as the level of the second rib in front, and as far as the spine of the scapula behind. "Considerable cough and expectoration."

Case 5 he describes as having *a previous history;* pneumonia five years ago; cough for two years; night sweats; cough and expectoration considerable; sputum often tinged with blood; scattered areas of broncho-pneumonia in both lungs, together with considerable emphysema; cavity in upper right lobe."

In the above descriptions there exists much discrepancy between the diagnosis made in identical cases, for the use of aseptolin and that for the use of serum and there is ample evidence to give the opinion that every one was advanced beyond permanent improvement, whether treated by nuclein, protonuclein or anything else devised by the human mind. They constitute the very class of patients against which I had warned Dr. Rochester not to use the serum with any hope of even satisfactory temporary results, as can be seen by the foregoing evidence; consequently, Dr. Rochester was not warranted or justified in taking the radical position he did against sero-therapy in tuberculosis, in an experience with five cases, none of

which he treated longer than one month, and four of which were moribunds, and it is unjust if not absurd, to compare sero-therapy with aseptolin. Another case, glandular tuberculosis, not mentioned above, he treated longer, and that one he himself says was improved.

As to nuclein I know it is of value in its proper sphere; but I wish to say a word concerning Dr. Rochester's tests with this preparation also, to which he ascribes invariably good results. Let us see how he dealt with the patients under nuclein:

Case 1, Miss C. (page 72 of JOURNAL), it seems is mentioned only to reflect on serum, for there is no scientific or practical data whatever with the mention of it, and there is a reiteration of regret to have used serum in her. (Perhaps this is Miss B., page 71. Inaccuracy throughout the report makes many points hardly intelligible.) The case *had not been tampered* with at all with aseptolin before nuclein was tried.

Case 2, Mrs. W. F. H., June 25, "infiltration with some softening of upper lobe of left lung," later "infiltration of the upper right lobe and entire left lung with softening of the upper lobe"; no cavity then. Nuclein was used for *two years*, and May 20, 1897, Dr. Rochester found "a *cavity* in upper left with infiltration about it." That is not such a wonderful cure. Probably nothing known to the human mind can arrest the disease in this case.

Case 3, Elizabeth McD., Nov. 11, 1895, "infiltration upper left, cavity surrounded by softening in upper right, etc." Nuclein used from November, 1895 to Aug. 15, 1896, "when she passed from under observation, still coughing occasionally and with some condensation in right apex." It does not appear that Dr. Rochester saw this patient after Aug. 15, 1896, when she still exhibited the latter symptoms, and yet in May, 1897, he hopefully remarks, "this case I consider *recovered* though there remains slight condensation in upper right." Is there a physician justified to call such a case a recovery?

Case 4, John D., Nov. 14, 1895, "infiltration in upper right; infiltration and slight softening in upper left; bronchitis in lower left." Nuclein was used till May 20, nearly seven months, and then Dr. Rochester found a "cavity." This was not present at the beginning of treatment. And "the sputum still contains the tubercle bacilli." There is not very great evidence in this case in favor of nuclein in advanced conditions.

Case 5 gives much better encouragement.

Case 6, David D., which had done so badly under serum on account of pains, etc., seemed to be naturally refractory to hypodermic medication, for he was prostrated repeatedly after injections of nuclein, and the fear of this, said Dr. Rochester, is what precluded (?) good results.

Case 7 was treated only two weeks, entirely too short a time for any improvement to have much significance, though the results are highly encouraging.

I have used nuclein extensively by hypodermic injections and I know that it does produce pain very frequently, and I have known physicians who hesitate about its use, just as Dr. Rochester did with serum on the plea that it produced too much pain, and the plea is just as unwarranted as it is in serum. If properly used in proper cases this criticism is without foundation either in serum or nuclein, except in a few refractory and sensitive patients with respect to hypodermic medication in general.

While the above cases are described sufficiently by Dr. Rochester to warrant any physician in declaring 98 per cent. of them hopeless under any kind of treatment, no one can tell to which class they belong. We have at least the following classes: Destructive broncho-pneumonia and cavities; destructive broncho-pneumonia without recognizable cavities; with diffuse febrile pneumonia, with or without a destructive character; with diffuse non-febrile broncho-pneumonia, with or without destructive process; with circumscribed febrile broncho-pneumonia; with circumscribed apyretic broncho-pneumonia. Information should have been given us on this question if it was intended by the author to show cause for success or failure. To take such a radical stand as he did one should have positive evidence.

As to the pain the Doctor says serum induces, I have already alluded to it. But I wish to say further that the directions accompanying each bottle of serum mention every untoward symptom of sero-therapy, and it is not long before most physicians who use serum find the means, if they follow the directions, of preventing pain and all other possible untoward effects of hypodermic medication. This pain is rarely worth mentioning and is caused by the preservative, which in one form or another, is found in all antitoxins and other organic products including nuclein. Pain is not a special result of Paquin's serum, as it seems is the author's intention to show. Dr. Rochester's experience on this score should not be utilized as a factor against the use of serum.

In refutation of Dr. Rochester's claim of serum uselessness, which is based on a few week's experience with five unavoidably fatal cases, four of which were practically moribunds before he began, I beg to mention the following physicians who used serum and are still using it when proper cases offer, not to mention the reports which I have myself made.

Dr. L. L. Shropshire, San Antonio, Texas, five cases of recoveries and improvements. (Reprint from *New York Medical Journal*, January, 1896.)

Dr. J. R. Lemen, Marion Sims' College, St. Louis, Mo., two cases recovered. (Reprint *New York Medical Journal*, Sept. 1, 1895).

Dr. J. A. Dunwody, Cripple Creek, Col., four recoveries and improvements. (Reprint New York *Medical Record*, July 11, 1896.)

Dr. H. C. Mitchell, Carbondale, Ill., two cases recoveries and improvements. (Reprint *North American Practitioner*; presented to the Southern Illinois Medical Society, Nov. 15, 1895.)

Dr. Hoell Tyler, Mentone, Cal., five cases recoveries and improvements. (Reprint *Southern California Practitioner*, October, 1896.)

Dr. William Miller, Boerne, Texas, one case recovered. (Reprint from *Southern California Practitioner.*)

Dr. J. M. Allen, Professor of the Principles and Practice of Medicine University Medical College, Kansas City, Mo., gives four cases, recoveries and improvements. (Reprint JOURNAL OF AMERICAN MEDICAL ASSOCIATION, May 29, 1897.)

Dr. F. T. Chamberlain, physician nose, throat and chest, East Hospital, Washington, D. C., under the use of various serums including Paquin's, reported twelve cases of decided improvement. (Reprint from *Virginia Medical Monthly.*)

Dr. Landon B. Edwards, ex-President Richmond Academy of Medicine and Science, reported decided improvements and recoveries and splendid benefits from the use of serum. (Reprint *Virginia Medical Semi-Monthly*, 1896.)

Dr. William Hutson Brioleau, Summerville, S. C., four recoveries and improvements. (Reprint *New York Medical Journal*, June 26, 1897.)

Dr. J. G. McFarland, Professor Pathology University of Pennsylvania, Philadelphia, June 3, before the AMERICAN MEDICAL ASSOCIATION. (New York *Medical Record*, July 10, 1897.)

Dr. J. D. Dillin, Ft. Worth, Texas, reported the cure of his wife.

At least twelve new reports testifying to the efficacy of Paquin's serum, from as many physicians of competence, are awaiting the medical press for publication.

I could mention the names of at least a hundred or more physicians, who have used serum according to direction, and obtained equally as good results, but they have not as yet reported to the profession and I have not time to get permission to quote them. The above-mentioned are some of those who *have* reported to the medical press and their statements can be verified by any one who will read their papers.

Now I will admit, as I did to Dr. Rochester before sending his serum for the treatment of his patients and warning him against too great expectation in advanced cases, that pure anti-tubercle serum is *not sufficient* in advanced cases, for in them there is *always* mixed infection. The Doctor did not heed me in this, nor did he when I explained that he should use a serum purposely prepared, for all mixed infections, and at least four of his cases were unavoidably mixed. The one single case which he claims was pure tuberculosis(?) was not sufficient evidence to determine anything, especially as defective circulation about the diseased areas in laryngeal tuberculosis adds seriously to the difficulty of treatment. He confesses he knew better in saying (paragraph 4, p. 71) "good results from a specific antitoxin should not be looked for in such cases." Yet he deliberately and in defiance of advice sought by him, and given to him, took moribund cases, used serum least suited to them and draws a parallel with an exploded nostrum on one side and worthy nuclein on the other, giving months of trial to aseptolin, years to nuclein and only a few weeks to Paquin serum, chiefly in aseptolin-wrecked constitutions.

I regret to have to take the matter up in this form, but since Dr. Rochester has not hesitated in the use of unwarranted language, based on insufficient data, after I had taken the pains to warn him against the use of serum in the very cases which he used to form his rash opinion; when I find the whole report so full of inaccuracies and discrepancies; and when I trusted him to do really scientific work, as a man, physician and scientist, I feel warranted in my action both for self-protection and in behalf of the cause of serotherapy. I trust that Dr. Rochester will do me justice.

MY EXPERIENCE WITH PAQUIN'S ANTI-TUBERCLE SERUM.

BY S. LANE ANDERSON, M.D.
CHADD'S FORD, PA.

I have used Paquin's antitubercle serum on several cases, and for me it has done all that is claimed for it.

Case 1.—Miss G., aged 25, weight 130 pounds. January and February, 1896, suffered from an attack of la grippe; did not clear up properly. Symptoms three months later, in May, dull and pneumonic areas in right lung amounting to pectoriloquy; acute lancinating pain, purulent expectoration, continuous cough, and exaggerated and very *painful tubercular pharyngitis*, daily afternoon rise of temperature, excessive night sweats and most offensive diarrhea; had also two hemorrhages in June. My treatment up to this time had been the recognized standard remedies for the existing conditions. A professor of laryngology from one of our colleges in Philadelphia had seen the case and his suggestions had been faithfully carried out, with absolutely no amelioration of the trouble. Two consultants pronounced the trouble advanced tuberculosis. In July, 1896, weight had fallen to 116 pounds; had had no appetite for weeks, in fact, had not averaged four ounces of food daily. Commenced using serum in July, 5 m. at first, increasing 3 or 5 m. daily till 30 m. was the regular dose.

Result.—In less than one week the throat was decidedly better, the sputum lost its pus character, night sweats lessened, cough was much improved; appetite became ravenous, could eat diet she previously had no taste for. In fourteen weeks, after using five bottles of serum, she returned to work (clerking in store) weighing 126 pounds, feeling well; throat entirely well, good appetite, sleeps well, and I might say, 100 per cent. better in every way.

I used in all on this case eight bottles of serum. Never had an unpleasant experience, and toward the last only gave her 25 m. every other day. She complained of tasting it in her throat within five minutes after the injection, and if any pain existed before the injection it would relieve it almost immediately. As I am very skeptical I used the serum believing the result would be negative, as I did not think Miss G. would live till September.

I have used it on other cases and the result has been on a par with this case, and I will also add that I shall continue to use the serum on any and all cases that will submit to it. I have never failed to see the benefit in seventy-two hours. It gives relief from those distressing symptoms which render that class of sufferers so miserable. All cases in which I have used it, after three or four weeks, I put on the following:

R Syrup hypophosphites, comp. (Fellows).	℥ ij	64 00
Spirit. frumenti / Ol. morrhuæ	āā ℥ iv	128 00
Extract malt, q. s. ad	℥ xvj	512 00

M. Sig.—℥ iv in H_2O fifteen minutes before meals.

R Quinin sulph.	℈ ij	8 00
Ferri sulph. exic	ʒ j	4 00
Strych. sulph / Acid arsenious	āā gr. iij	19

M. Ft. pil., No. lx
Sig.—One after meals.

These formulæ I have always found well borne after two or three weeks use of the serum, no matter how rebellious a stomach may have been prior to that time. My patients do well on this treatment and have never yet had to discontinue it. I am treating what was said to be a hopeless case now and she is doing well.

REPORT OF OBSERVATIONS MADE UPON A CASE OF GASTROSTOMY.

BY M. F. COOMES, A. M., M. D.
Professor of Physiology, Ophthalmology, Otology and Laryngology, in the Kentucky School of Medicine; Member of the American Medical Association, and the Kentucky State Medical Society; Ophthalmic Surgeon to the Louisville City Hospital and the Kentucky School of Medicine Hospital; Consulting Ophthalmic Surgeon to St. Mary's and St. Elizabeth's Hospital, etc.
LOUISVILLE, KY.

The stricture of this child's esophagus was the result of swallowing concentrated lye nearly a year before he was operated upon.

At the time of the operation Feb. 16, 1896, the stricture was impervious, not admitting the smallest bougie, and the child had not swallowed for six days. A modified Franck's operation was performed, and a rapid and uninterrupted recovery followed. The patient was five years of age.

Some six weeks after the operation he began swallowing fluids, and is now able to swallow thick broths and take milk with mush or oatmeal, which shows that the cicatricial tissue is being rapidly absorbed. Observations with a view of determining the quantity and quality of fluid found in the stomach, were commenced on Oct. 10, 1896, at 12:45 P.M., and were made on the various dates given below in connection with the tests. The greatest length of time between the periods

of removal from the stomach and the time at which the digestive tests of the fluid were made, was 271 days, and the shortest 131 days.

All of the specimens were passed through ordinary filtering paper as soon as they were drawn from the stomach; after filtering, the tests for hydrochloric and lactic acid were made. The fluid was then placed in a clean bottle and properly numbered and labeled so that no mistake as to quantity, date or chemic reaction could be made. All of the specimens have been kept in a steam-heated room where the average temperature was 70 degrees, F., and on many occasions a much higher temperature was obtained, but it never went below 50 degrees, F. There was no special effort made to exclude the air from any of these bottles, as their mouths were only stopped with corks or cotton wool. All of the specimens seem to be well preserved at this writing, with one exception, and that is the specimen which was obtained on Oct. 15, 1896, at 8:30 A.M., after fasting 12 hours. On the top of this fluid is a moldy mass, the greater portion of it being white, a small fringe around the edge being decidedly black; this specimen showed less evidence of lactic acid than any of the others.

I did not see him from October 16, until October 26. On that day he came to town in an open wagon with his parents, who live fifteen miles in the country. He had breakfasted at 6 A.M., partaking of some sweetened coffee well mixed with a goodly portion of rich cream, and some oatmeal mush. This youngster is no exception to the rule which governs the *genus homo*. He loves to gratify his appetite and persists in swallowing those things that are pleasing to his palate, as sweets and certain kinds of soups. If it is an ordinary broth or something which he does not fancy, he prefers to have it put into the stomach through the opening which is in that organ, rather than go to the trouble of swallowing. He arrived at my office at 11 A.M. Early in the morning the father had purchased him some peppermint candy with red stripes on it. He continued to suck the candy and swallow the saliva for a greater part of the trip, but had nothing else to eat or drink from 6 A.M., until he arrived at my office. I removed from his stomach, at that time, 150 cubic centimeters of gastric juice. It was decidedly pinkish in color, the color being due to the pigment upon the candy. There was also a decided odor of peppermint in the fluid. Both hydrochloric and lactic acid were present. No digestive test was made.

The results of the tests reported to determine the digestive powers of the different specimens of gastric juice, were made on July 9, 1897, 271 days after removal from the stomach. It will be noted that No. 8 was procured on Feb. 27, 1897, or 131 days after removal from the stomach, and that there was no digestive test made of No. 1.

No. 1.—October 10, 1896, at 12:45 P.M., after fasting five hours, 19 cubic centimeters of gastric juice were removed from his stomach. Tests showed both lactic and hydrochloric acid present.

No. 2.—October 13, 1896, at 8 A.M., after fasting twelve hours, 10 cubic centimeters of gastric juice were removed and both acids found present. July 9, 1897, this fluid completely digested boiled egg albumin and readily coagulated milk, demonstrating its active properties.

No. 3.—October 13, 1896, at 1:30 P.M., after fasting five hours, 45 cubic centimeters of gastric juice were removed. Both acids were found present. July 9, 1897, this specimen possessed all the qualities of normal gastric juice, readily digesting boiled egg albumin, and coagulating milk.

No. 4.—October 14, 1896, at 8:30 A.M., after fasting thirteen and a half hours, 12 cubic centimeters of gastric juice were removed. Both acids were present. July 9, 1897, this specimen was not very active in digesting albumin, but promptly coagulated milk. The coagulum was solid and not flocculent like that produced by gastric juice under ordinary circumstances.

No. 5.—October 14, 1896, at 2 P.M., 65 cubic centimeters of gastric juice were removed. He had been fasting five hours and forty-five minutes. Both acids were present. July 9, 1897, this specimen gives no reaction whatever upon albumin or milk; that is, it will not dissolve albumin, nor does it coagulate milk; showing that it has undergone complete degeneration, possessing none of the properties of a digestive fluid.

No. 6.—October 15, 1896, at 8:30 A.M., 45 cubic centimeters of gastric juice were removed. He had been fasting twelve hours. Both acids were present, however only a trace of the lactic. July 9, 1897, this specimen possessed comparatively active powers in digesting albumin and coagulating milk.

No. 7.—October 16, 1896, at 3 P.M., 20 cubic centimeters of gastric juice were removed. He had been fasting five and one-half hours. Both acids were present. July 9, 1897, this specimen was moderately active in digesting albumin, and very prompt in coagulating milk.

No. 8.—February 27, 1897, after a fast of six hours, 27 cubic centimeters of gastric juice were removed from his stomach. It contained both lactic and hydrochloric acid. July 9, 1897, 131 days after removal from the stomach, it dissolved egg albumin and promptly coagulated milk. Its digestive powers were decidedly more active than any of the other specimens. Nos. 2 and 3, however, resembled it very much in activity.

The specimens of gastric juice which were removed after long periods of fasting, showed almost no lactic acid, which goes to substantiate what is now conceded to be a fact, viz., that the stomach in its normal healthy condition does not produce lactic acid.

Another point of importance that I observed in connection with this case, was the rapidity with which the fluids passed out of the stomach. On one occasion, particularly, I remember to have given him four ounces of water by actual measurement. I had at the time an endoscope introduced into his stomach for the purpose of examining the lining membrane of that organ. I held the glass to his lips until he had done swallowing, and then stepped across the room to get a tumbler to catch the fluid that would come from his stomach, and immediately proceeded to drain the stomach. I secured a little less than two ounces of fluid, the remainder of it having been absorbed by the stomach, or forced over into the duodenum. Very little of it was absorbed, as the whole time occupied in swallowing and draining could not have been more than two and one-half or three minutes.

This also goes to confirm observations that have been made by others concerning the disposition of the fluids that enter the stomach from the mouth, viz., that they are rapidly carried from the stomach into the duodenum. It is worthy of note, that in the observations of the fluids taken from this boy's stom-

ach, that the longer the fast, the less the amount of lactic acid; there being only a trace of it in all instances where the fast was twelve hours or more.

A glance at the report will show that the smallest quantity of fluid obtained at any one sitting, was 12 cubic centimeters, or nearly half an ounce.

Again, it will be noted that after a fast of twelve hours, there was as much as 45 cubic centimeters of fluid found in the stomach, which proves that the stomach always contains some fluid.

Another point is, that after 271 days it is well preserved, showing almost no evidences of chemic deterioration.

A NEW TEST FOR LACTIC ACID IN THE GASTRIC CONTENTS AND A METHOD OF ESTIMATING APPROXIMATELY THE QUANTITY PRESENT.

Presented to the Section on Practice of Medicine, at the Forty-eighth Annual Meeting of the American Medical Association, at Philadelphia, Pa., June 1-4, 1897.

BY J. P. ARNOLD, M.D.
PHILADELPHIA, PA.

In view of the value of the detection of lactic acid in the gastric contents, especially in the diagnosis of gastric carcinoma, the importance of which has been increased by the later work of Boas, and because of the uncertainty and unreliability of Uffelmann's test, I present the following.

The test which I detail is simple and easily applied, the reaction is characteristic, the results reliable. It also affords a method of approximately estimating the quantity of lactic acid present. The test solutions used are:

Solution No. 1, consisting of saturated alcoholic solution gentian violet, 0.2 c.c.; distilled water, 500 c.c.

Solution No. 2, solution ferric chlorid (U. S. P., 1890), 5 c.c.; distilled water. 20 c.c.

The method of applying the test is as follows: Into a small porcelain capsule place 1 c.c. solution No. 1 and add from a pipette 1 drop of solution No. 2. The violet color of solution No. 1 changes to a bluish violet after the addition of the ferric chlorid. To this mixture add drop by drop the filtered gastric contents. If lactic acid is present the color of the solution changes from a *bluish violet* to a *green or greenish yellow.*

Alcohol, glucose, butric acid, acetic acid and phosphates, in quantities below 2 per cent. do not interfere with the reaction as they do in Uffelmann's test. The reaction is not interfered with by acetone or albumoses; sulphuric, nitric and hydrochloric acids do not give the reaction.

Delicacy of the test.—One drop of a 0.02 per cent. solution of lactic acid gives a very distinct reaction. The usual limit set down for Uffelmann's test is the detection of 0.05 per cent. If phosphates are present there is at first a reddish violet color produced, which in the course of a second or two gives way to green. If phosphates be present to the extent of 0.5 per cent. it may take two or three drops of a 0.02 per cent. solution of lactic acid to bring out the reaction distinctly.

To determine approximately the quantity of lactic acid present the procedure is as follows: It is well to prepare a 0.2 per cent. solution of lactic acid to use as a standard. Take two narrow test tubes of equal size and to each add 5 c.c. of test solution No. 1 and 5 drops of test solution No. 2. To one tube add 0.5 c.c. of a 0.2 per cent. solution of lactic acid; the mixture turns green and all traces of violet or blue disappear. To the other test tubes add, drop by drop, the filtered gastric contents until the color is the same shade of green as in the first test tube. Comparison may be made more accurate by equalizing the volumes of the solutions in the test tubes by adding to the first tube as much distilled water as was added of gastric contents to the second tube. To get the percentage of lactic acid present, divide 0.1 by the number of cubic centimeters of gastric contents used.

This is not given as a means of determining accurately the amount of lactic acid present, but with care the amount present can be estimated within 0.1 per cent. and to one accustomed to the use of the test a per cent. as low as 0.05 can be estimated.

3722 Walnut Street.

THROMBOSIS OF THE JUGULAR VEINS.

Presented in the Section on Practice of Medicine, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, June 1-4, 1897.

BY HELEN BALDWIN, M.D.
NEW YORK CITY.

When Lasègue in 1879 reported a case of phlebitis of the neck, he stated that after painstaking search, he was unable to find a similar observation published, either in France or elsewhere. Since then a number of cases of this kind have been reported, yet they are sufficiently rare to make each one of peculiar interest.

The following record is that of a patient admitted to the New York Infirmary for Women and Children, in the service of Dr. Josephine Walter, to whom I am indebted for these clinical notes.

Ida D., aged 19 years, American, seamstress. Admitted to hospital Nov. 30, 1896.

Family history. Negative. Mother died from an accident, father and two brothers living and well.

Personal history. Measles when 8 years old. Rheumatic fever when 10 years old, with two subsequent attacks on two succeeding years. Her heart has troubled her from early childhood, beating rapidly whenever she ran or exercised vigorously. This became much worse after the attacks of rheumatism, so that now she has palpitation on every exertion. For several years she has not been strong. During the past year the menses have been irregular, and for the past four months she has had amenorrhea.

Present illness. About five weeks ago patient noticed that her feet became slightly swollen. The swelling, which was painless, has become gradually more marked since then. A few days ago an aching pain developed in the left axilla and in the left side of the neck. There was also swelling in the neck, which when first noticed would disappear when she sat up, and reappear when she lay down.

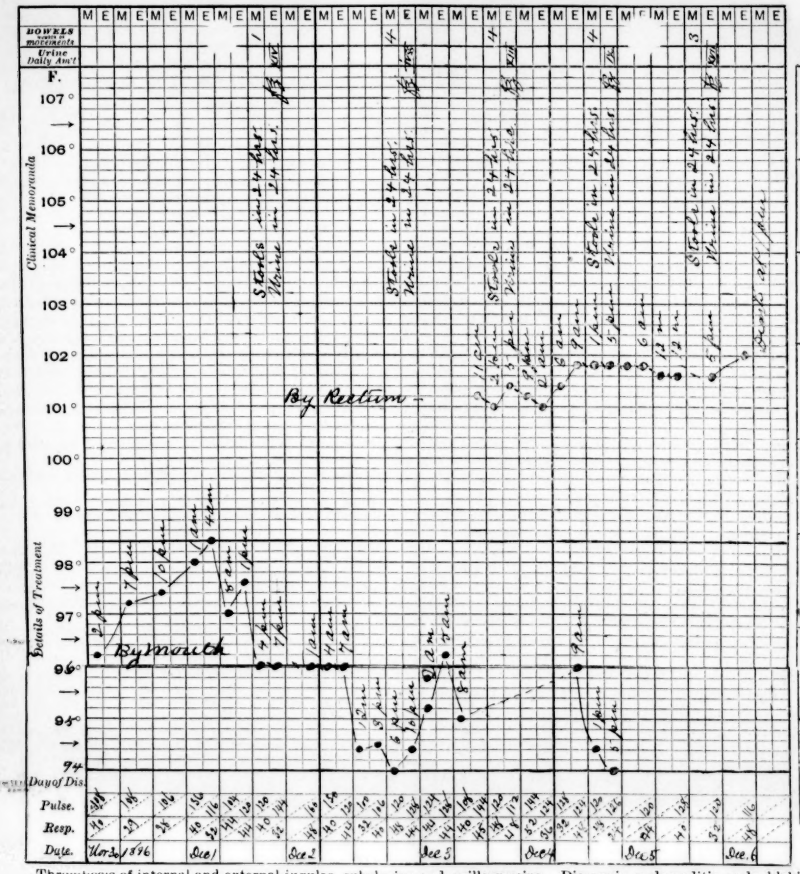
On admission to the hospital, the patient appears very weak. There are cyanosis and dyspnea present. Temperature 96.2 degrees F. (35.7 degrees C.). Pulse 108, respiration 40.

Examination December 1. There is lividity of the lips with dilatation of the veins on the edge of nostrils and tip of nose. The pupils are widely dilated. The tongue is slightly coated. The pulse is small, rapid and compressible. The dorsum of the left hand is markedly swollen. Both legs are swollen and pit on pressure. There is marked cyanosis of the skin. The glands in the groin are not enlarged. *Heart.* Left border, 4.3 cm. outside nipple line; right border, 2.5 cm. to right of sternum. Double aortic and mitral murmurs. Apparent dilatation near base of heart, which suggests an aneurysm. Very slight murmur heard in the vessels of the neck. This is out of proportion to the sounds at the base of the heart. A systolic murmur is transmitted down the sternum.

On the *left side of the neck* there is a hard, tender swelling of the lower part of the external jugular vein, which is tortuous. There is a hard lump in the left axilla, extending down the arm for about five inches. The left arm is edematous and quite pale, not cyanosed. The liver is enlarged. There is fluid in the abdominal cavity.

Urinalysis. Amount in twenty-four hours 420 c.c. Turbid, reddish brown in color, reaction markedly acid. Sp. gr. 1033, albumin present. Urea 2.8 per cent.; no sugar. Amorphous urates. A few uric acid crystals. Granular, hyaline and epithelial casts.

December 2. Patient slept very little during the night. Pulse small but regular. There is a slight puffiness in the palm of the hand, but the edema on the dorsum is less marked today. She does not have earache. The external jugular vein is felt as a cord running up the side of the neck to about one-half inch below the lobe of the ear. There is bifurcation of this cord about half way up the neck. Nothing felt passing



Thrombosis of internal and external jugular, subclavian and axillary veins. Diagnosis, endocarditis, endophlebitis.

the first day it reached 98.2 degrees F. (36.8 degrees C.), but after that it varied between 94 F. (34.4 C.) and 96 degrees F. (35.5 degrees C.). On the fourth day it was discovered that while the temperature was 95 F. (35 C.) by mouth, it reached 101.2 F. (38.4 C.) by rectum, and after this, although there was especial precaution taken to avoid an error in registering, there was a difference of from 6 to 7.8 degrees F. (3.3 to 4.3 C.) between the temperature by mouth and that by rectum. (See temperature chart.)

December 4. Pulse seems stronger and there is less tenderness in the arm and hand. There is slight vibration felt in the first intercostal space near the sternum. In the same position posteriorly. The whole left side of the neck is fuller than the right, following the course of the sterno-cleido-mastoid muscle. A prominence, circumscribed, about two inches long, is found on the inner aspect of the arm just below the axilla. The axilla is not as hard or as tender today, and the feet are less edematous. In the lungs, posteriorly there is dulness in the lower part on both sides, and voice sounds are heard over this region. There are fine crepitant râles heard near the bases. Urine in twenty-four hours only about 135 c.c.

The temperature, which was taken by the mouth during the first five days of her treatment, was persistently low. During there is slight dulness on percussion, which extends to the second intercostal space, and lies a little further to the left than to the right. The first and second sounds of the heart are heard in the first intercostal space. The character of the pulse is slightly weaker in the left than in the right wrist.

December 5. Slept a good deal during night, but restless during sleep. At one time coughed up a little blood. Dulness in both lungs posteriorly from the angle of the scapula to the base. On auscultation, over the upper part of chest on both sides, the inspiratory murmur is harsh. Fine crepitant râles are heard at the end of inspiration. The heart murmur is not

heard in the back behind the posterior axillary line. Percussion reveals presence of fluid in the thoracic cavity. Thickened cord extending more markedly down side than arm, this morning.

Urine. Amount in twenty-four hours, 510 c.c. Very clear, amber in color, markedly acid. Sp. gr. 1020, albumin 5 grams to liter. Urea 1.5 per cent.; no sugar. Epithelial and hyaline casts.

December 6. Patient failed rapidly, and died in the afternoon.

The postmortem examination was made by Dr. Elizabeth Mercelis. As permission for the section was restricted to that which could be made through the ordinary median incision, the veins of the extremities could not be examined. The record is briefly as follows:

Body moderately nourished. There is general edema, which is most marked in legs and feet, least in upper extremities and chest. On opening the abdominal cavity, there is a free escape of turbid yellow fluid. In both pleural cavities there is also a considerable amount of fluid, with a few firm adhesions between parietal and visceral pleuræ. The apex of heart is in the fifth intercostal space in the mammillary line. In the pericardial sac there is a considerable amount of a clear amber fluid.

The *heart* is much enlarged, being 16.5 cm. in length, 10 cm. in width and 7.5 cm. in thickness. The right auricle is very greatly distended, measuring 13.5 cm. in length. It is completely uncovered by lung. It presents somewhat the appearance of a great distended vein. The left auricle appears normal. Right ventricle shows lines of fat distinctly marked. On the posterior surface is a considerable area of puckering, as of sclerotic change. The vessels on the surface are distended. The ventricle is filled with fluid blood. Length of cavity 8.5 cm.; thickness of wall 1.6 cm. The tricuspid valve is thickened throughout in ridges, and the edge is curled and thickened. There are no vegetations, and no ulcerations. *Pulmonary valves.* Two of these are fairly thin and flexible; along the free edge of the third (the aortic cusp) there is much thickening, having a firm, almost cartilaginous feel.

Left ventricle. The wall is the same thickness as the thickest part of the right. The endocardium is smooth. The aortic valves are thickened on edges. The aorta is soft and smooth. The mitral valves are very much thickened, and adhesions between the different cusps form an almost uniform piece about the ring. There are no ulcerations or vegetations.

The left innominate, left subclavian, and the external and internal jugular veins, extending up nearly to the lobe of the ear, are filled with firm thrombi. There are ragged bits of thrombus extending down into the superior vena cava.

Behind the left auricle, and pressing upon it, is an enlarged, hard lymph-node, 3.7 cm. in length, 2.5 cm. in width and 1.2 cm. in thickness. Extending up each side of the trachea is a chain of enlarged lymph nodes, each about the size of a pea. One of this size is situated at the junction of the subclavian and internal jugular veins. None of these seem to press upon the veins. There is a small extravasation of blood, which has dissected up the left side of the trachea and around the enlarged lymph nodes behind the left auricle. The origin of this blood can not be found.

The *lungs* are congested throughout and both show, on microscopic examination, an early stage of lobar pneumonia. There are areas of infarction in both lungs.

The *kidneys* show cloudy swelling, with scattered areas of old connective tissue degeneration.

The *liver* extends 5 cm. below the margin of the ribs. It is the seat of very extensive fatty change.

The *mucous membrane* of stomach and intestines is congested.

The *spleen* is markedly enlarged, congested and friable.

The large veins of abdomen are free from clots.

The uterus and appendages are normal.

On microscopic examination of the thrombosed veins, the internal and external jugulars present the usual picture of organizing thrombi. There are delicate lines of connective tissue extending into the mass of cells which obliterates the lumen of the vessel. The endothelial cells are slightly increased in number, as are the connective tissue cells in the walls of the veins, but these changes are evidently secondary to the thrombus formation. In the subclavian vein, on the other hand, there is an endophlebitis which is evidently of longer duration and primary to the formation of the clot. Around nearly one-fourth of the circumference the intima is fairly normal, and here the clot lies free in the lumen. The greater part of the intima, however, is much thickened and very irregular along the inner border, In places the lumen is encroached upon to one-fourth or one-third its diameter by this thickened intima. At one portion, the blood clot and intima have become so blended, through the proliferation of intima cells and formation of fibrous bands, extending from the media into the center of clot, that the line of demarcation between them can not be determined. The middle and outer coats are thickened throughout the corresponding portion of the vessel. It appears as if the thrombus formation has been caused by the obstruction to the current of blood caused by this endophlebitis, the stasis being favored by the failure of compensation in the heart.

Bouillard considered that there was a rheumatic phlebitis, similar to rheumatic endocarditis or pericarditis. In this patient's history there is a record of three attacks of acute articular rheumatism, but the last occurred seven years before the present illness.

In 1887, Friedrich Pohl published an article on thrombosis of the subclavian and jugular veins. In this he reported a case, and reviewed the literature of the subject, finding seven cases in which the jugular veins were involved. The records are briefly as follows:

1. Case reported by Pohl, of carcinoma of the vagina, with metastatic growths throughout the viscera. An enlarged carcinomatous lymph node, pressing upon the junction of the subclavian and jugular veins, led to thrombus formation in the left brachial, subclavian and jugular veins, which extended downward for the distance of 1 cm. into the left innominate vein. There were no areas of infarction in the lungs. Death ensued six days after the appearance of the thrombus.

2. An imperfect record of a case reported in 1860, in which the innominate, subclavian and jugular veins were the seat of thrombi caused by the compression of neighboring organs.

3. Ramskill, 1874.—Case of cancer of the uterus, with thrombosis in left external jugular, internal jugular, subclavian and innominate veins and in the superior vena cava. The immediate cause of thrombosis if not given. The patient died one week after the symptoms of thrombus appeared.

4. Walter Smith, 1870.—History of this case not known. The autopsy revealed a large, dark bronchial gland pressing on the superior vena cava, which had caused stasis and thrombus formation in the right internal jugular, the subclavian and axillary and the right innominate veins. There were no metastases, no pyemia or other phlebitis. The heart was dilated, the tricuspid valve thickened, the other valves normal.

5. Clodomiro reported a case of phthisis with cavity formation at the left apex, and adhesions between the pleura and left innominate vein causing stasis and thrombosis in the subclavian, axillary, deep brachial, cephalic, basilic and jugular veins. The patient died fifteen days after the appearance of the clot.

6. Moizard, 1875.—A case of sarcoma of the mediastinum, obliterating the lumen of the superior vena cava, and causing thrombosis of this vessel as well as of the right innominate and right external jugular. The patient died after three or four months.

7. Robert, 1880.—A patient in the later stages of "lung disease," with an enlarged lymph-node, pressing upon and adherent to the left innominate vein, with thrombosis in this vessel and in the internal jugular. The patient died four months after the thrombus formed.

8. More, 1882.—A case of aneurysm of the ascending aorta, with pressure on the superior vena cava, with a large clot occupying the right innominate, subclavian and external jugular veins. Death eight days after the appearance of the thrombus.

Besides these cases reported by Dr. Pohl, I have found records of the following:

9. Lasègue, 1879.—A case of phthisis with thrombosis of the external jugular, subclavian and humeral veins. The thrombus softened and all symptoms of phlebitis disappeared ten days after its formation. No direct cause was discovered in this case.

10. Languebeck, 1881.—A case of tumor of the neck, adherent to, or growing from the internal jugular vein, with thrombosis at that point. Operation with removal of tumor and of thrombosed portion of vein. Recovery. Tumor supposed to be a syphilitic gumma.

11. Pettit, 1882.—A case of yellow fever followed by symptoms of pyemia. At autopsy the right subclavian, external jugular and cephalic veins were occluded and filled with coagulated blood and fibrin. There were areas of infarction and metastatic abscesses in the lungs. Death twelve days after clot formed.

12. Lejard, 1882.—A case of caseous pneumonia with cavity formation. Thrombus, which was supposed to be due to the cachectic condition of the patient, formed in the external jugular and its anastomosis with the anterior jugular, and in the deep veins of the forearm. Death two days after the formation of the clot.

13. George Wilkins, 1883.—Case in which the superior vena cava was converted into a firm, fibrous cord with organized thrombi extending into the innominates and internal jugulars on both sides. The thrombus was thought to be due to an endophlebitis, caused by strain. Death four months after the symptoms of thrombosis in the neck.

14. Kelsch, 1887.—A case of carcinoma of the stomach. Thrombi found in the left external jugular and subclavian, also in the inferior vena cava, from the renal vein to the bifurcation of the vessel, and in the iliac and crural veins on both sides. The patient died one month after the formation of clot in the external jugular vein.

15. Picot, 1884.—Case of phthisis, with the brachio-cephalic trunk of left side obliterated by a clot which extended into the jugular and axillary, but not into the vena cava. This thrombosis was due to compression by a hypertrophied lymph-node.

16. Comby, 1892.—A case showing symptoms of occlusion of the superior vena cava with thrombi in the left external jugular and left axillary veins. The cause was not found. There was a history of syphilis, but no improvement under antisyphilitic treatment. Under treatment with Fowler's solution the patient made a perfect recovery.

17. Younge, 1895.—Case of thrombus formation in superior vena cava, left innominate and jugular veins and left lateral sinus, occurring in Bombay. The condition probably due to exposure to extreme heat, with possibly malarial infection.

18. Gatay, 1896.—A case of rheumatic phlebitis, with death following thrombosis of the subclavian, jugular and innominate veins.

19. Renouard.—Case of rheumatic phlebitis, involving internal jugular and subclavian veins.

20. Nicolle, 1897.—A case of endocarditis, attacking the mitral valve with phlebitis of the external jugular vein.

I was unable to examine the original papers in the last three cases. In all the above cases, the thrombus was found in the jugular vein alone, or in that, together with the larger trunks below the vein.

In the internal jugular there may also be thrombus formation secondary to diseased conditions in the lateral sinus. Indeed, Gatay makes the assertion that phlebitis of the deep jugular vein is regularly secondary to inflammations of the sinus.

In 1880, Lemoine reported a case of death from thrombus formation in the lateral sinus and internal jugular vein in a tuberculous patient, the other veins of the neck being normal.

Allport, in an article on "Purulent brain deposits and phlebitis and thrombosis of the cerebral veins and sinuses following ear disease," found that out of the 169 cases which he reported, in nine the internal jugular was involved. All of these nine died.

Pitt in 1890, in an analysis of fifty-seven cases of ear disease and of the complications which led to death, found that in eleven of these cases the clot extended into the internal jugular, with death from pulmonary pyemia.

Herczel in 1893 reported a case of thrombosis of the transverse sinus and jugular vein, with recovery after operation.

Jansen, in an article published in 1893, on brain thrombus following middle ear disease, found the internal jugular vein involved in twelve out of 215 cases reported.

In studying the causes of thrombosis of the jugular veins, from an examination of the above records, we find that, as in any situation, the conditions favoring coagulation are: 1, sluggish or arrested circulation; 2, inflammatory processes in the vein due to injury or to bacterial invasion, or to the presence of irritating substances held in solution in the blood; 3, morbid conditions of the blood rendering it more readily coagulable.

Out of the thirty-four cases found, in eight, or nearly a fourth, there was pressure on the vein leading to stasis. In sixteen, or nearly half, there was a grave blood dyscrasia, three having carcinoma, one, sarcoma; six, tuberculosis; two, tertiary syphilis; one, pyemia following yellow fever; two, acute articular rheumatism, and one probably malaria combined with changes due to heat exposure. In five cases there is endophlebitis, three probably due to rheumatism, one to syphilis and one to injury. In thirteen cases, or 38 per cent., the condition is secondary to middle ear disease.

In only one of these cases, that of syphilitic gumma, does the morbid process seem to have originated in the jugular vein itself. In the others it formed secondary to thrombus in the innominate vein, extending away from the heart, or secondary to clot in the lateral sinus, extending toward the heart. In many of the reports it is stated that the clot was adherent to the vessel wall, showing that there had been an endophlebitis, either secondary to the thrombus formation, or primary and leading to it.

The symytoms are those of phlebitis in any vein. Following the description of Gatay, these are pain, tenderness, edema, venous arborization, the presence of an indurated cord, and a line of redness if the vein be superficial. In one case the edema was limited by the median line of the neck. In that of Dr. Walter, there was a peculiar subnormal temperature by mouth, while that by rectum was elevated. The general symptoms are usually masked by those of the original disease.

While the prognosis of venous thrombosis is, in general, not very grave, it would seem from a study of the above cases, that in the jugular veins it is seldom found excepting in the last stages of fatal diseases. In sinus thrombosis, the involvement of the jugular vein makes the prognosis much more grave from the liability to pulmonary infarction. In only four of the cases noted above was there recovery. One, occurring in the course of phthisis, made a spontaneous recovery; one, of doubtful etiology, recovered under the use of Fowler's solution; one of syphilitic tumor recovered after operation, as did one of sinus thrombosis following ear disease.

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MEDICINE AS AN EXACT SCIENCE.

Presented to the Section on Practice of Medicine, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, June 1-4, 1897.

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The study of the human body involves the consideration of the framework, the muscular, vascular and nervous systems. In these we find the highest development in mechanical and physical skill. The composition of the structure is the assimilated material secured from the nutritive substances ingested and conveyed to the various parts of the body. The whole system is a laboratory of chemic evolutions and synthetic combinations presided over by the mysterious monitor called life. Science, in the supreme sense, is applied in the construction of this handiwork by the creator of a mechanism unequaled in beauty, symmetry and potentialities, far beyond the highest achievement of the finite being, man.

It is man's privilege to investigate this creation and interrogate every step in its development, in its normal existence, in its decline and destruction. To do this it is, however, necessary to follow along the line which governs its existence and keep in view that its nature is a scientific problem of the most intricate character.

In health the whole being moves on without the slightest deviation in its activities, and if the scientist understands its workings he is prepared to note any change that may take place should this misfortune occur, and from the scientific study of the physiologist we pass over into the realm of the pathologist when some destructive energy has interfered with the normal condition of the body.

The physiologist considers every organ and every tissue and every element in the formation of tissue and in the secretion of the fluids of the body, before he is fully conversant with every phase in the existence of the human being.

On the other hand the pathologist marks every deviation from the normal and notes the abnormal formations, the accretions vitiated, the germs developed by the ptomains in the system, and formulates their chemical elements, and observes the reasons why the conditions of health have been disturbed. To illustrate, the physiologist tells of the presence of certain secretions in the stomach, in the liver, in the many organs of the body, so that we may know what is required to keep the body in a healthy condition and, aided by the analytic processes of chemistry, we may know the requirements to maintain the health-giving influences necessary to this existence. The pathologist aided by chemistry notes the departures from the laws of health and is prepared to demonstrate the necessity of a change in the assimilative and elaborative activities of the human system.

In this work the pharmaceutist comes forward with the remedial agencies of his laboratory. Each medicine having been duly analyzed and formulated, the therapeutist may now take cognizance of the relations between the disorganized properties composing the tissue of the body, the causes that lead to disease, and the chemically indicated elements necessary in replacing the wanting or disorganized elements necessary to health.

In advocating this method for the establishment of the laws necessary to the scientific treatment of disease, and in devoting our best energies to the practice of medicine as an exact science on the lines herein advocated, nothing more is done than what is the outgrowth from the experience in other but more common fields of investigation.

Take for instance the intelligent farmer in the cultivation of his fields. He notes the character and quality of the soil, and until he has chemically investigated its constituents he can not tell to what fruitage it is best suited or what may be necessary to restore it to the proper condition for the growth of luxuriant crops or blooming foliage.

The iron furnace does not gleam with its dazzling flame, neither does it glow with its intense heat, nor does the white stream of its liquid metal flow from its imprisoning walls until the chemist has tested every ore, every coal, every limestone and manganese, and every element tending to give the result. Having determined by chemic investigation, we know absolutely what metal may be produced.

The value of the scientific investigation necessary to the highest attainments is still better exemplified in the latest methods employed in the management of obtaining gold from refractory ores. There was a time and not long since when great fortunes in gold ore were thrown aside because the means of separating the gold from the sulphurets of iron, copper and zinc was unknown. It was not until the chemist, by years of toil, found the key that unlocked the treasures hidden in the tomb of buried ages.

The cyanid process, together with the aid of electricity, now extracts gold that once was lost to the world and where not lost required great labor and often unrequited efforts to secure it only in part.

May we not, then, learn something from the scientist whose stimulus is the acquisition of wealth while the profession of medicine is the hand-maiden of love, whose mission is to lengthen out the cord that binds us to life and set forward the mile-stone on the journey that moves through devious pathways to the unknown.

In a paper prepared for the Medical Society of the State of Pennsylvania, the arrangement of the remedial agents were indicated according to their formulas and it was shown that this was possible and in the line of progress. From the investigations made, it appears that medical agents possess properties which are similar wherever the formulas are expressed in like characters. When, therefore, we possess a complete system of definitely arranged pharmaceutic agents, according to their chemic formulas, then we are prepared to treat disease upon the same certain methods applied in the chemical laboratory. The time will come when we shall also have the formula of the condition of the organ of the patient in health. We will also have the pathologic state expressed in a legible way, and then as skilled practitioners we will have a positive remedy with which to correct the abnormal condition under consideration, because we have known factors in the problem to be solved.

There will then be no doubting, guessing or hoping for a plausible diagnosis or prognosis, but the medical profession will be engaged in doing a work which deals with facts and will rank as the most learned among all the erudite of the human races. This work is already accomplished in part. The anatomist goes to the beginning of the formation of the material constituting the several parts of the body. He expresses the elementary composition in chemic language. The physiologist in his functional investi-

gation deals largely in chemic expressions and elucidations. The pathologist too has made advances in the exploration of this field and, as previously noted, the pharmaceutist has already given us large sheaves from his gleanings of golden treasures.

What is therefore required is the prosecution of these investigations to legitimate completeness and then an adaptation of the whole system to the practical necessities of the intelligent and scientific practitioner.

I may, therefore, hope that the time has come when we can find text-books for our schools which contain something more than the mere outlines of the drugs, the names and symptoms of disease, the customary methods of treatment and the doubtful prognosis.

The vast accumulation of isolated cases, the many divergent opinions, the constant change in the trend of medical thought, could then be crystallized into fixed scientific facts, and the almost super-human efforts in the acquirement and attainment of the lore necessary to equip the typical physician would then be greatly simplified, and the end could be seen from the beginning, and the study of medicine would be regarded as an exact science.

In an acid condition of the stomach an alkali is the remedy for its correction. The chemic expression is known and the treatment rational. In the treatment of rheumatism the excess of acids, and sometimes of an alkali, is determined. The appropriate chemic antidote is utilized and the chemic reason is known. In that condition of the liver when an excess of cholesterin or stercorin is present, bromid which combines with them, is indicated, and again for known chemic reasons. In the use of digitalin (German) the chemico-physiologic reason should be ascertained, and for the study of these subjects laboratories should be established in every medical college, that medicine as an exact science may become the immeasurable wealth of the physician for the healing of the people.

DISCUSSION.

Dr. HENRY BATES, JR., Philadelphia—The principle which the writer has brought to our notice is one of vital importance to that department of medicine which, be it said to our shame, is least developed—therapeutics. Any one who listened to the discussion on typhoid fever must have reached the conclusion that there was an absence of that knowledge the need of which the paper so strongly impressed—definite ideas in therapeutics. Our pharmacopeia bristles with complex preparations from which we look for definite results. It is as impossible as to look for one to remain on taking four from six. It can not be. We must have the active principle having a definite and distinct effect upon the human organism; an isolated effect, so that we can crystallize the remedy into tangible and proper doses known to influence functions toward the normal.

SURGERY ONE HUNDRED YEARS AGO.

AN HISTORICAL STUDY

BY DR. GEORGE FISCHER.

DEDICATED TO THE GERMAN SURGICAL ASSOCIATION.

TRANSLATED FOR THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION BY CARL H. VON KLEIN, A.M., M.D.

(*Continued from page 338.*)

XI.—WAR SURGERY UNDER FREDERICK THE GREAT.

The beginning of German military surgery; Interest of Frederick the Great; In the seven years' war; Portable and stationary field hospitals; Transport, diet, medicines; The siege hospital at Schweidnitz; Fresh air, neutrality, mortality; The surgical Pepinière at Berlin; The Prussian army surgeons; Bilguer; Schmucker; Theden; Voitus, Mursinna, Görcke; Jasser, Ollenroth and other regimental surgeons; The military sanitary regulations under Joseph II; Of minor states.

The German barber puts on a gay coat, not forgetting to include all his stupidity, roughness and quackery, and then represents himself as the army surgeon (Feldscherer) of the last century, to whom the soldier must entrust his shattered limbs. It appears that German military surgery began in Prussia in 1630, with the appearance of the army surgeon. Before that time there was neither army physician nor hospital in the Brandenburg army; the sick soldiers were obliged to look after themselves wherever they were, beg for their living and become a charge upon the community. The first army surgeon was appointed on the electoral body-guard; he ranked between the secretary and the drummer and received two and one-half thalers every ten days. The great elector first began to institute many things after the French models; the commander was obliged to engage an army surgeon for each regiment at a salary of five to seven thalers a month, and likewise one for each company. These shaved the soldiers. There was as yet no thought of military hospitals. History records only one qualified military physician of the great elector, Gottfried Purmann, who served with the Brandenburg troops in the Swedish war, was later surgeon in Halberstadt, and in Breslau where he died in 1721. His celebrated surgical laurel wreath (Chirurgischer Lorbeerkranz, 1685), as well as his work on gunshot wounds, testifies to a great enthusiasm for science. When during the reign of Frederick III. the plague broke out in Brandenburg, the community was ordered to build hospitals at their own expense and to care for the plague stricken soldiers without compensation. So it remained until the eighteenth century. The body-guards were given the preference; the court apothecary in Berlin furnished them with free medicine and gave the officers of the guard their medicines at half price, while for the other regiments the military medicine chests had to suffice. This was changed when that monarch, the later King Frederick I, in 1712, gave the army surgeons of the regiments the funds for the purchase of medicines for the soldiers, and for transportation of the same allowed them two horses with forage. At this time the staff quarters, and they alone, were provided with military hospitals; as for the rest, the heads of the companies and the regimental army surgeons had to provide for the accommodation of the sick soldiers.

Frederick William I. first laid the corner stone for a true organization of the Prussian military medical system, when he appointed as surgeon-general Holtzendorff, to whom all the military surgeons were subordinated. For their training there was founded in Berlin the Anatomie, the Collegium Medico-Chirurgicum and the Charité. Eight young surgeons chosen by the surgeon-general worked under the supervision of the college, received a yearly pension of a hundred thalers, with free tuition. From these pensioned surgeons, a creation of Holtzendorff's, the regimental surgeons for the entire army were selected. The student who stood first in order of promotion was taken into the Charité for a year's practical training, and the senior in the Charité remained there till he was sent to Potsdam where, under the direction of the body-physician, he treated the officers of the court. A public examination was held quarterly. The three seniors were obliged to finish the anatomic and surgical course each winter, so that if any vacancies occurred in the regiments, they could immediately respond. Their social station was still low. Sub-

jected to ridicule and reproach, the army surgeon enjoyed no respect from the common soldiers and still less from the officers. These were for the most part as crude and ignorant as their king. Even in the year 1790, a tall lank man in a short black frock, with a long sword and lace about his neck, stiff and ceremonious, and who had learned nothing, was nicknamed by the people "Friedrich Wilhelm officier." The education of the officers was so slight that Lafontaine, at that time army chaplain in Halle, related of an especially brave captain that he could not read writing. The officers allowed the company army surgeons to wear the broad sword, and arrested the regiment army surgeon whenever one of the "giants" died. Schmucker, who in his youth was for a long time a surgeon with the Potsdam grenadiers, experienced many an anxious hour with these darlings of the king. He himself says that these people (who, as is well known, were impressed into service by every kind of violence, in so much that a common warning of parents was "Do not grow or the recruiting officer will get you"), on account of their extraordinary size and beauty were especially prized by the king, and had to be treated with all possible faithfulness, industry and care.

Under these inauspicious conditions, when every educated man declined with thanks to serve as a surgeon in the army, *Frederick the Great* entered into war. The first campaign showed the existing misery everywhere, and that above all things, the executive ability of the military physicians must be increased. To this end Frederick sent, as his father had done, a few talented young men from the number of the salaried surgeons for study in Paris and Strasburg. In order to meet the temporary need he permitted, after the first Silesian War, where the existing distress must already have appeared very severe, in the year 1744, through J. L. Petit, twelve French surgeons (2 maitres chirurgiens, opérateurs et démonstrateurs and 10 chirurgiens aides à maitre chirurgiens) to come, and appointed them to positions in his army. The French now directed the Prussian field hospitals, performed the operations and served during peace in the hospital for invalids (Invalidenhaus). They had German surgeons for assistants, to whom they were obliged to give instruction, although they were not acquainted with the German language. But not a single one of them distinguished himself in any way, as was the general expectation, so they were subordinated to the surgeon-general and never allowed to treat patients independently. The king himself diminished their number and again filled the places with Germans. In 1790 the French entirely disappeared. "They have cost the state much, but have accomplished little, and so they have died out, even to the last one" (Mursinna). In spite of Frederick's partiality for French institutions, he could not see his way to introduce their medical system into his army, because the cost was too great. One of the most important improvements was that the king, through Dr. Cothenius, the successor to Eller, had field hospitals built. On the other hand, the regulation that one groschen for each soldier should be paid as medicine money to the regimental army surgeon each month, with which he was to buy the necessary remedies (a regulation which was in force till the year 1829), had the great disadvantage that the army surgeons who could not live well on their incomes came in conflict with their duties. Abuses arose in the hospitals, and also a profit, in that, for instance, the army surgeons, in order to save something for themselves, gave the fever-stricken raw saltpeter, instead of the customary but expensive quinin.

It is astonishing that the great warrior, who in his writings on the war exhaustively discussed provisions and sutler's affairs, the enjoyment of beer and brandy, etc., touched very briefly on assistance on the battlefield and the transportation of the wounded (see below). Frederick occasionally visited the war hospitals, gave money to the sick soldiers, examined the medicine vials and showed special interest in certain wounded soldiers. One admires his sharp practice in an examination which he employed with the physician Tralles, a rival of Lessing, when he (Tralles) treated Henry, the brother of the king in Breslau for pleurisy. At one time Frederick persuaded a captain of his bodyguards to submit to an amputation which he had refused, and ordered the patient to be carried in a conveyance, because the army was obliged to go forward. At the camp of the wounded Gen. von Geist he asked Theden whether nymphæa and quinquina had been given, and was satisfied when answered in the affirmative. At another time he visited a wounded Austrian general and ordered Theden "to be reasonable with the general," and when he had extracted a piece of iron from the thigh of a grenadier of the guards, to whom he had become attached, he preserved it. He required reports every evening from his first surgeon-general, who received his orders for the most part through the adjutant-general. In spite of all the measures which he took in behalf of the wounded, he was still very much dissatisfied, as appears from an interview with the court counsellor, Zimmermann, who shortly before the death of the king had been called from Hanover to treat him. "But," said the king, after he had stated that in the War of the Bavarian Succession the dysentery had been successfully treated with tartar emetic at his suggestion, "it is not only in the matter of prescriptions, but chiefly in all other regulations which are made in an army. In all my wars my orders in respect to my sick and wounded soldiers have been very poorly obeyed. Nothing in my life has grieved me more than when I saw these brave men, who had so nobly given health and life for their fatherland, badly cared for in their sickness and wounds. They are often harshly treated and many a poor soldier has died for want of good nursing. Nothing has ever distressed me more than to think I was the innocent cause of the death of some poor man. But since the last war I have given such orders as will make it very difficult for the knaves, rascals and rogues of the army to deceive their king and so shamelessly and barbarously rob the poor soldier of the help and comfort so necessary to him." Although the king regarded certain of his surgeons very highly, as Schmucker, whom he had live with him at the castle in Sanssouci, and Theden, whom he called to Potsdam to treat an abscess of the thigh, yet, in general, the position of military surgeon was not respected. Yet the army surgeons, Feldscherer (a name first discarded under Frederick William III.), always ranked after the subaltern officers. How little they were regarded is shown by an order which Frederick the Great (1781) issued for the captains in the field hospitals. The captains, appointed to the supervision of the hospitals, were obliged to not only see that the food for the sick was regularly prepared and dispensed, but they also

had control of the doctors and army surgeons, "so that arms and legs would not be amputated wholesale, and that in general no amputation should be undertaken until mortification had set in, for which the captains were also responsible." If the surgeons did not do their duty, did not give the patients food regularly, or if they appropriated anything belonging to the hospital, then the captain was "to immediately arrest the guilty man, whoever he might be, and put him in chains," whereon the case would be prosecuted with the greatest severity. One consequence of the above mentioned conversation between the king and Zimmermann was that the court counselor Fritze of Halberstadt, who in an anonymous article had exposed with great candor the evil conditions of the Prussian military hospital system, was called to Potsdam by the king, and about a month before his death (1786), was charged with the management of the field hospitals. He said in that article ("Das königl. Preus. Feldlazereth u. s. w.," 1780), among other things: "The Prussian army in Saxony consists of 72,000 men and the Saxon army of 22,000. Of the former about 4,000 have died in the hospitals and of the latter only 48. What a striking comparison! Certain conditions must necessarily exist in the Prussian army and their hospitals to have caused the greater mortality," and further, "Just the same old methods in economy and medicine which were followed in the war from the year 1756 to 1763 have been followed in this last war, to the destruction of the patients and the ridicule of the whole civilized world, without use having been made of the fruitful experiences of twenty years. . . . The honest fraternal Saxon showed his sympathizing comrades the misery and death which his brethren, the Prussians, often innocently suffered, and the Prussian physician, full of zeal and energy, stood by ashamed and could answer nothing but, 'I can not help it.'"

Let us follow our Prussian colleagues into the Seven Years' War. At the pinnacle of the medical world stood the general staff-physician Cothenius, who, with the two army physicians representing him, exercised the highest authority over the hospitals, physicians, etc., while the surgeon-general directed the surgical part. In a second army the chief staff-physician and the second surgeon-general held command. Schmucker, Bilguer and Theden were surgeon-generals. Under them were all the surgeons in the army; first of all the so-called supervising surgeons, staff surgeons, chief surgeons and pensioned surgeons who treated the wounded in the hospitals. Subordinate to these were the ordinary army surgeons who were engaged with cases of internal sickness, as well as in attending the wounded, and received half the salary of a chief surgeon. When it came to battle, a surgeon-general with a few supervising and lesser surgeons, took a position as near as possible to the fighting troops, in order to bandage the wounded on the battlefield. Ditches and other protected places served to cover them while they worked. All the Prussian military physicians were exposed to the fire. Schmucker received a shot in the chin and another in the neck, at Soor, while he was applying a bandage, and later, as surgeon-general, in the battle at Prague, a shot on the edge of the orbita, so that he fell from his horse unconscious and spat blood for four days. In spite of severe pain he did not spare himself from attending to his many duties. When the first bandage had been applied, the wounded soldier was given diluted vinegar (which every Austrian soldier had in his canteen, while the Prussian carried brandy with him), saltpeter, or other medicine to ward off inflammation and to avoid a violent wound-fever. If necessary the wounded soldier was bled and then taken to the *movable hospital*. These were for the most part located in castles, churches or granaries in the neighborhood of the principal magazine, the military chest and the field bakery, so that the patients were under protection, were well cared for and could be easily transported. Here, under the supervision of a surgeon-general, the higher surgeons and the German and French pensioners, an accurate examination took place, the necessary dilations and incisions were made, bullets and splinters were extracted and trepanning and amputating were done Often an extracted splinter became a relic. Prussian as well as Austrian officers had their extracted bones polished and set in a ring or cross, beset with brilliants, and the name and date of the battle engraved thereon in black. Those sick with internal diseases were separated from the wounded and taken to special hospitals where staff physicians were in attendance. In simple surgical cases here either a higher surgeon was called in consultation or the patient was removed to a surgical hospital. The staff physician visited the patients twice a day, kept journals and supervised the diet and ventilation. In case of a lack of physicians the higher surgeons took charge of internal ailments; on the other hand, the physicians visited the hospitals of the surgeons if the first or second physician gave an order to that effect. The sick and wounded remained in the movable field-hospitals until they could be brought to a permanent hospital. It was a great misfortune that after the battle the wounded were not immediately taken in charge, because often a safe place for the field-hospital had to be first sought out; sometimes four, sometimes six days passed before the wounded were all brought together. At Prague one side of the city was being stormed and the hospital was located on the other side on the white mountain, and there it was almost eight days before the last of the wounded came into the hospital. The consequence was that, as Schmucker complained, most of the amputations were not made until a few days after the battle, and then as a rule resulted fatally, while many soldiers were so weakened by the transportation that an operation was no longer possible.

Transportation was in a bad condition under Frederick the Great. The instruction on this point in his "Unterricht von der Kriegskunst an seine Generals," reads: "When the victory has been gained I command that a detachment shall be made of those regiments which have suffered most, that the wounded shall be cared for and brought to the hospital, which must be prepared beforehand. Further, in caring for the wounded let men not forget the human sympathy toward those of the enemy." As a rule they used the empty flour and provision wagons, which had also to bring forage, to convey the patients to the hospital. "The dysentery patients were for the most part carried to the hospitals in the wagons which were to take back rations for the army. Into these same wagons which were filled with the foulness of the disease and the rank poisons of the prisons, the bread for the healthy soldiers of the army was loaded, even on the same day" (Fritze). If the army decamped immediately after a battle there was necessarily the greatest haste in bandaging the

wounded, for they were taken along. Thus it was in 1760 after the battle of Liegnitz, where the king commanded that all the wounded be immediately bandaged and brought to the wagons, because the army must march twelve miles on that same day. Only two hours were allowed for the bandaging. When the time had expired the severely wounded were laid on the baggage, bread and provision wagons. Those slightly wounded were obliged to march near by, but without their equipments. That was indeed a relief in itself, since the Prussian infantryman had to carry sixty-five pounds on the march. There were still five hundred, mostly injured in the upper extremities, who were unable to march but found no conveyances. Schmucker decided quickly, and obtained from the king a command to have a regiment of dragoons dismounted. Within half an hour all the wounded were on horses and the dragoons marched beside them. In this way the three days march to Breslau was accomplished. When it was necessary they even transported those who had lately suffered amputation. For these Schmucker had the field-bed of an officer fastened to two poles, and handles attached, so that it could be carried by two horses. Often many days elapsed before the wounded, attended by the company army surgeons, arrived at the *permanent field hospitals* (Hauptlazarethe), where they remained until their complete recovery. The king or the commanding officer decided on the location of these, whenever possible in large cities and not too far from the army. They took for this purpose castles, churches, monasteries and barracks. In the Seven Years' War such chief hospitals were in Breslau, Glogau, Stettin, Dresden, Torgau and Wittenberg. They were directed by a staff officer, who had the general supervision of the entire management of the hospital, especially of the supplies and nursing and of the men ordered into the hospital. Under him inspectors and commissaries paid the wages, took care of the apparatus and kept the lists of the stock of the hospital. Every regiment that had many sick therein ordered an officer to the hospital; in case of a few sick, an under-officer; and these had charge and reported concerning their own people. Also the regiments after a battle gave several company surgeons over to the hospitals that they might not lack help; as soon as they could be spared they were sent back. Each under-surgeon cared for twenty to thirty wounded or fifty to sixty inwardly sick, who lay upon straw sacks, with the exception of the severely wounded who had beds. Four to eight under-surgeons were under the command of a supervising surgeon who instructed them, made daily visits, treated those most severely wounded and performed the operations. Only in severe cases and important operations was the over-surgeon obliged to ask advice of the staff-surgeon and follow his directions. The lower surgeons assisted, attended to the night watching, had to administer the prescribed medicines four times a day, and keep a journal, but they could undertake nothing of importance. Their business was also more or less that of the hospital attendants and nurses of the present day. Only the most skilful among them was sometimes permitted, under direction, to make an incision or to trepan. So-called waitresses (Aufwäterinnen) attended to the fomentations, etc. The surgeon-general had supervision; he visited the hospitals unexpectedly, was consulted orally and by letter and frequently performed the most important operations himself. At eleven o'clock in the morning everything had to be in order, because then, by the order of Cothenius the entire hospital force, physicians, surgeons, commissaries, apothecaries and officers met in conference to discuss hospital matters. (In later years the so-called head hospital commission had charge of the directors of each hospital; this commission consisted of the general staff physician, the first surgeon-general and a staff-officer, who at the outbreak of the war ordered everything for the mobilization, appointed physicians and surgeons and met daily to decide together on everything. 1787.) A report was made to the first surgeon of the army, as well as to the surgeon-general, and twice a month an accurate list of patients was furnished, so that from all the lists they could obtain a summary of all the sick in the army. One evil result of the recruiting system instituted at that time, which appeared especially in the examination of those suffering from internal diseases, was the different languages spoken among the sick, since there served in the army of Frederick the Great, Russians, Danes, Swedes, Poles, Hungarians, Dutch, Turks, Italians and French.

"The Prussian soldier kept his weapons with him as long as he lived as an evidence that he was born to the use of them." From this point of view he enjoyed in the hospital, during the Seven Years' War, a freedom which was very injurious to him. He received wages, bread and meat, in the same amounts as when in active service, and was master concerning his mode of living; nothing was taken from him. The physician could only give him friendly advice in the matter of his diet; he had no further authority; the Prussian soldier also guarded with great care the freedom which his king had extended to him. In this respect the Prussian hospital regulations were behind others, for in Austria the soldier was required to observe a prescribed diet and, as in England and France, he received no wages so long as he was cared for in the hospital. After Theden had taken the lead in the improvement of the hospital of his artillery corps, the matter of diet was (1787) arranged by a new regulation in Prussia. From that time on the physician prescribed the diet. He fixed a full portion at three-fourths of a quart of meat soup with barley or rice, one-half pound of meat and one and one-half pounds of bread. Besides, he prescribed half and quarter portions; if necessary, wine also, which formerly the physician had to pay for out of his own pocket when he ordered it. Wages and cash were taken from the soldier and deposited.

The *apothecary shops* were attended by a chief field-apothecary, several field-apothecaries and assistants, a continuous control of whom made pecution scarcely possible. Since the first army physician alone made the selection of medicines, for the most part only such were found as agreed with his views. The formula which Cothenius introduced as well for external as for internal remedies were often nonsensical mixtures and frequently contained ten or fifteen ingredients. For the sake of curiosity we will quote a menstruum of vulnerary water, composed of thirty-four substances, which was used by Bilguer; it was an aqua vulneraria s. sclopetaria vinosa pharm. Parisiens.

S. Sclopetaria vinosa pharm. Parisiens:

Rec. Radicis symphiti majoris, Foliorum ejusdem, Bellidis maj. et minoris, Bugulæ, Saniculi, Betonicæ, Scrophulariæ, Plantaginis, Agrimoniæ, Hyperici cum summitatibus, Vineæ per vincæ, Hederæ terrestris, Artemisiæ, Veronicæ, Verbenæ, Tele-

phii majoris, Millefolii ana uncias quatuor—Salviæ, Angelicæ, Tanaceti, Absinthii, Chelidoniæ majoris, Fœniculi, Aristolochiæ clematitidis, Menthæ, Hysopi, Nicotianæ ana uncias octo—Rutæ, Chamomillæ, Scordii, Majoranæ, Rorismarini ana uncias quatuor—Summitatum et florum lavendulæ, Origani, Calaminthæ ana uncias sex—Macerentur per quatriduum in Vini generosi libr. quinquaginta ponderis civilis, postea destillentur ad dimidias.—Si spirituosa expetitur hæc aqua Vulneraria, loco Vini, herbis modo præscriptis spiritus Vini rectificati super affundantur libra quinquaginta, atque destillentur.

There is still in existence an apothecary's outfit of Frederick II. which was found on the battlefield at Hochkirch in 1758, contained in a spacious cabinet inlaid with brass. Purgatives occupied the principal place (rhubarb, jalap, aloes, sulphate of magnesia, Rochelle salt, etc.), then many emetics (ipecac, tartar emetic), antispasmodics (spirits of ammonia, camphor, musk), antimony and iron preparations, many powdered herbs, opium and a mass of remedies now entirely antiquated. For surgical purposes there were especially balsams (balsam of Peru, of Mecca, of white amber, etc.), besides much sugar of lead and a great quantity of sublimate. Half of the compartments in this apothecary's cabinet are empty. An absurd custom, originated by the Frenchmen in the Prussian army, was the giving of French names to all the materials for bandaging in the field hospitals, although not a single one of the army surgeons could pronounce or write these names correctly. For example, Bilguer taught that the bandage for the stump of the upper arm was called *le bandage pour l'amputation du bras*, and the plane for the exarticulation of the elbow, *le doloire pour la luxation du coude*.

It might be of interest to inspect some certain hospital more closely, and we will choose for that purpose the *siege hospital of Schweidnitz* which the surgeon-general Schmucker erected in 1762. The large village of Neudorf, a short mile from Schweidnitz and half a mile from the depot was selected for the purpose. There ten days before the opening of the trenches Schmucker arrived with a great number of staff, chief and pension surgeons, more than sixty hospital surgeons and many stores, so that he could put everything in proper order. Immediately four great massive barns belonging to the court of a noble were cleaned and bunks built a foot above the ground. Schmucker quartered himself in the master's house with the staff physician, hospital inspector and the field apothecary. Four large rooms in the village were reserved for those injured about the head. The patients with internal diseases were taken into the barns before they could be transported to Breslau, the wounded officers were put in the other houses. At the entrance to the trenches they built a great wooden shed, which was protected from the bullets of the enemy. Into this depot for the wounded ("Blessirtendepot"), all those wounded in the trenches were brought, the first bandages were applied, and when necessary they were bled. As soon as a number of wounded were gathered they were taken early in the morning or in the evening in wagons to the siege-hospital. A regiment surgeon with four company surgeons kept watch every night in the depot and were relieved after twenty-four hours. In the hospital itself a staff or chief surgeon, with a pensioned surgeon and four hospital surgeons performed continuous watch service in order to immediately provide for the newly arrived wounded; if there were any among them in a very serious condition the matter had to be at once reported to the surgeon-general. Each directing surgeon had about fifty wounded, with five hospital surgeons under his supervision. Schmucker detailed a few surgeons for the patients having head injuries, and relieved them from all other work. A journal was kept in each ward in which the course of the disease was recorded often from hour to hour. This day-book could easily be kept up in Schweidnitz where they worked leisurely, since it was not crowded with too many cases at one time, as it was not possible to do at the great battlefields. Every five days a number of wounded were sent to Breslau on wagons, but those having injuries to the head and the seriously wounded were kept in the hospital. When at the end of September the severe cold began with snow the patients could no longer remain in the barns, so a great sheep-stable had to be cleaned. Twenty men were occupied eight days in carrying out the manure, and cleaning and purifying everything. In the four great doors and in various places in the walls Schmucker had square holes cut and windows inserted. There the patients were sufficiently warm, suffered less from draughts than in the barns and were very well satisfied. The stable was fumigated once a day and aired after every bandaging.

Although the Prussian surgeon-general insisted on cleanliness and fresh air in the field-hospitals, and ordered that the patients be removed into new rooms every three or four weeks in order to clean and air the old ones, and had windows and doors opened and the ventilators of Theden used, and would not tolerate too high a temperature in the rooms, yet this common sense was by no means general. Moreover, there was crowding together of the sick. In the hospital in Dresden "the beds of the patients were usually crowded so closely that one straw bed touched the other and there was scarcely enough space left to allow one to pass between the rows. Indeed, very often one was obliged to step over the patients, and the feet of one were almost in contact with the head of another. Even when the hospitals were sometimes relieved by the transportation of many patients it was rare that they could sweep or scour the floor" (Fritze). The consequence was that a violent epidemic prevailed in the hospitals and many attendants and army surgeons died. Another disadvantage in the field-hospitals of which Bilguer and Baldinger especially complained was the frequent transportation of the patients to and fro, which cost many a one his life, and also the frequent change of the acting surgeons, in so much that a wounded soldier often came under the hands of four, six, ten and more before his recovery.

(To be continued.)

DISCUSSION ON THE SEVERAL PAPERS ON TUBERCULOSIS.[1]

Dr. DENNISON of Denver, Colo.—We are indebted to Dr. McFarland and Dr. Rochester for their excellent papers read this morning, and I wish particularly to commend Dr. McFarland for his excellent statement of what tuberculosis is. I have no controversy with those gentlemen as to their treatment or the results of their experiments. I object to Dr. Cohen's warning against seeking after a specific for tuberculosis as if it were a will o'-the-wisp. I commend the work of Prof. Klebs, Dr. von Ruck, Dr. Trudeau, and those men who are in search of a specific for tuberculosis. Their work is to be commended because it is painstaking, and for the hard lines which they are following. In the first place it seems to me impossible that we can prove anything by testing tuberculin on healthy persons, for tuberculin can only affect individuals previously infected with tuberculosis. The assertion of one of the gentlemen that there

[1] See preceding JOURNALS for the papers read. The stenographer's copy was not received in time to print with the papers.—ED. JOURNAL.

V 2
189

is such universal infection in the human race is to my mind proof that immunity exists to a certain extent, otherwise all must die. Each one of us must have a certain proportion of immunity, yet if immunity exists it is only relative. It is relative immunity, then, which we have in mind when we put in an argument for immunity.

I have no controversy with the gentlemen who emphasize the necessity for individualizing patients and the necessity of building up the resisting cells. I am myself under the ban of having said that the good results which I obtained from the use of antiphthisin and antituberculin were due partly to the climate of Colorado. I admit the charge that we have a great help in fighting tuberculosis in that fact. Altitude is an important element. I am, too, as much a crank on exercise in tuberculosis as anybody. But I approve of the efforts of gentlemen to discover something which will produce immunity. From experiments now being made, I believe it exists in the extract of dead bacilli. Prof. Koch's new remedy, I believe, is made from the extract of live bacilli. But somewhere there is an antitoxin influence in the bacilli themselves which, in very small repeated doses, will eventually set up an immunity in the system which increases the natural immunity. We are thus coming to recognize that all infectious diseases are to be fought by either artificial or natural antitoxin, and, through experimentation on animals we are yet to learn just what that element is and how it can be obtained. Prof. Klebs and Dr. von Ruck are getting nearer and nearer to it every few months.

Dr. KLEBS of Asheville, N. C.—Concerning this question there are two kinds of work which are most important; one is work in the laboratory, the other is clinical work. These are to be separated absolutely. But what has been found in laboratories can be tried in hospitals. To assert the contrary is to put a stop to all scientific result. Regarding antitoxin, etc., tuberculosis is so various in its forms that, to say a remedy, even after long observation, will cure it every time, is not possible. We must have animal experiments. To judge simply by clinical observation is not possible. Many remedies have been praised too quickly simply because the patient has improved for two or three weeks. In tuberculosis that will not do. We must have many observations on animals, and long study. We must first go to the laboratory. Clinical results come later. All sorts of remedies have been brought forward, some of them without any scientific basis whatever. The list includes many which are not mentioned in our pharmacopeia.

Hygienic management has been properly commended, but it is not so easily carried out. We can say to our patient, go into the fresh air and stay there, and live on a proper diet. But it will fail simply because your instructions will not be carried out a sufficient length of time, and time is most important in tuberculosis. If we want to cure tuberculosis we must treat the constitution of the patient, or he may become infected again after five or eight years and the whole process have to be gone over again. To enforce hygienic rules we must have suitable surroundings and keep the patient under observation for a long period. This treatment has been much perfected in this country. Dr. Trudeau stands foremost with his sanitarium in the Adirondacks, where his patients are treated according to the strictest hygienic principles. After they have spent a year there, they go out and observe those rules outside. They know how to take care of the expectoration, they know everything which will tend to prevent infection of other people and themselves again. To bring hygienic care forward properly it is necessary to have institutional treatment, and the State can do in this line more than the individual. If an Association like this will take steps to promote this idea the death rate from tuberculosis will certainly diminish.

Dr. HERRICK of Cleveland, Ohio—What I shall say at this time will be somewhat in controversy with opinions which are prevailing, and I must beg your indulgence and ask your consideration in the matter. The whole doctrine of today, on tuberculosis, rests upon the theory that it is an infectious disease due to a specific germ. The doctrine has come into vogue the last twelve or fifteen years. We knew something about tuberculosis twenty years ago. I have practiced medicine more than thirty years, and have been a clinical observer and a fair student of the question, and I must say that I belong to the doubting Thomases. I can not fully accept the idea of tuberculosis being due to infection. I am inclined to regard it rather as a disease due to disturbance of the blood making process, to disturbance of the digestive organs, to the air we breathe, and to a number of factors. I never look for a specific cause of this condition. I think it is futile to do so. The gentleman who has taken his seat has admitted as much—a high authority for the bacterial idea of the disease. I have no expectation of finding a specific in the form of tuberculin or anything else. We must go back to physiologic principle.

Dr. J. M. ALLEN of Kansas City, Mo.—The life of all bacteria depends as much upon other life as does that of human beings. Now in the human family about one-fourth furnish pabulum on which tubercle bacilli can live and develop. That, I think, is in accord with statistics of today. The tubercle bacillus begins its attack upon some structure, and causes certain pathologic changes which are fixed and definite. The aim of treatment is destruction of this pabulum by means of which the germ has its existence. If that pabulum is not present, you may inject the germ into the blood and it will die right there. Those who believe in dietetic treatment often ignore all else that is hygienic. That is not fair. We use all—hygiene, diet, climate, etc. The theory of the climatic treatment is that the elements necessary for the growth of the tubercle bacilli do not exist; for instance, in Colorado. Hence Colorado is an excellent climate for the consumptive.

I have tried the Paquin serum treatment in four cases. One patient has recovered. Why do I say that? Simply because he has been under observation for two years and not a single bacillus can be found. They were abundant before. I do not say that this person, if tubercle bacilli should become located in his lungs, would not again take the same disease. You can not yet say that of diphtheria. We are looking in that direction. In another case the tubercle bacilli have become attenuated, and the man is now performing hard work and is improving every day. Still he has not fully recovered, and is under treatment. The other two cases were much benefited, but in them there was large destruction of tissue.

I conclude that with serum coupled with hygiene, the use of creosote and tonics and every other thing which can be brought to bear, and sending the patient to a climate where tubercle bacilli have not the conditions for their growth tuberculosis can be cured, provided these measures are adopted early.

Dr. J. N. UPSHUR of Richmond, Va.—I believe the underlying factor in tuberculosis is malnutrition. I believe that immunization, which exists in the majority of the human race, exists because these is not a fertile soil in which the bacilli can develop. We of the South have an object lesson in the negro. It was an exceedingly rare thing, before the war, to see a negro with phthisis. We saw cases where there was scrofula upon the neck where it was inert, but it was rare for it to develop in the lung. Since the war, the tendency of the negroes has been to migrate to the city, where their conditions are different from what they were before the war when they had fresh air and abundant nutritious food, eating a great deal of liver and bacon and corn bread, with an abundance of vegetables, having warm clothing and plenty of light in their rooms,—since they have gone to the city where they are overcrowded, where they are frequently out of work, where they are frequently thrown upon the city government for support, where many have become thriftless, in summer living upon watermelons and spending what money they have upon what they call "society" for the purpose of having a big funeral when they die; as a result of these unwholesome conditions and malnutrition tuberculosis of every variety has become rife among them.

Dr. GEORGE M. STERNBERG of Washington, D. C.—I must express my surprise on hearing, at the present day, a gentleman talk about the doctrine of the infectiousness of tuberculosis. I think one might as well talk about the doctrine of there being an AMERICAN MEDICAL ASSOCIATION. The demonstration has been made long since. It is satisfactory to the profession. It can be repeated for the benefit of any one who desires, at any time and in any pathologic laboratory, that the tubercle bacillus causes unmistakable tuberculosis in suitable animals.

As to the question of susceptibility and immunity, the general laws do not differ from those relating to other diseases. There is a specific infectious agent. There can not be tuberculosis without a tubercle bacillus, any more than there can be any other infectious disease without its specific infectious agent. But there must be something more for infection. There must be a susceptible individual. We all know that there is a great difference in the susceptibility of individuals; and that that difference depends partly upon inherited characteristics. Certain animals are more prone to it than others. The susceptibility depends partly upon the early life. Leading a sedentary life, being shut up in close rooms—those individuals who have not the necessary tone which is obtained by living in the fresh air in Colorado and elsewhere, are more susceptible. Any debilitating cause, as insufficient diet, hemorrhage, or anemia makes the individual less resisting. Another important point is that there is some degree of immunity in every individual, but probably not enough but what it may be overcome in the most resistant, and its being overcome depends mainly upon two factors: 1. The virulence of the tubercle bacilli, which varies very much at different times. 2. The

dose. In all of our laboratory experiments we find that in most infectious diseases a small number of bacteria may not give rise to infection when a considerable number may do so. So that people who live in air loaded with tuberculous sputa are much more likely to be infected than those who live in a climate where there is nothing of that kind. In short, we have the specific cause, the predisposition which is inherited to some extent and is developed by environment, and then the exciting cause; a person lives in an atmosphere loaded with dust, irritating the lungs; or there may have been some recent inflammatory condition of the mucous membrane which makes him prone to infection.

Dr. JAMES TYSON of Philadelphia—As one who has made a clinical trial of Dr. McFarland's antituberculin I may say a few words. I am not one of those who decry the effort to discover an antituberculin, a direct serum cure for this condition, although my own clinical results were absolutely negative, as I so reported to Dr. McFarland. They were necessarily so because of the very short time I was permitted to carry on the observations. But in that very short time I learned what seems to me to be a most serious difficulty in the determination of the clinical value of this remedy and the mode of administration. Until we can devise some other mode of administration than by the hypodermic syringe the difficulties will be almost insuperable in making a clinical trial of this remedy. With the urticaria and the extremely painful effects which attended the use of the remedy a short time in my wards, the patients were in a state of actual rebellion. The treatment is dreaded, so I was glad for some reasons that the serum gave out.

Dr. PAUL PAQUIN of St. Louis, Mo.—It would seem that tuberculosis is a mixed infection, and it has been thought useless for anyone to search for a specific remedy. That is probably true. I doubt if the world will ever find a remedy which will be called specific for any form of tuberculosis, whether pure or mixed. But we must recollect that, although this may not be possible, yet on that very line of argument and research it has been admitted here that certain cases of tuberculosis, perhaps all forms of at some stage or other, recover without the assistance of the doctor. Therefore, we must conclude that there exists in nature a power that can cure tuberculosis. What is that power? It is this very thing that we want to imitate in our researches. If a child recovers from diphtheria without medicine or in spite of medicine, nature gets the credit, and we exclude the case from the results obtained by antitoxin or attribute the result to antitoxin produced in the system itself. Now what the medical profession can do in diphtheria is to use antitoxin developed in the system of the horse instead of in the system of the patient suffering from diphtheria. It has been tried in tuberculosis, but with quite different results in many instances and for many reasons, chiefly because pulmonary tuberculosis is complicated with other germs besides tubercle bacilli which produce mixed toxins in the system.

One statement, which I think is not justified, is that we ought to wait seven or eight years before we come to a conclusion that any treatment of tuberculosis is rational. I do not think you will find a treatment which is specific in a hundred years. But I do think we ought to give credit to any kind of treatment which produces an improvement in the condition of the patient. What we want in clinical work is not, perhaps, laboratory work. The patient wants work on himself. He wants to be cured, and I think we are justified in giving the benefit of any measure which causes improvement to the patient and the profession.

I agree with Professor Klebs that the more we have of verification of clinical work by laboratory or experimental work, the better. At the same time, the medical profession has to confront a condition in tuberculosis and can not wait for experiments. When we do find beneficial results in clinics we have the right to give the profession the benefit of our experience.

Dr. MCFARLAND—To the gentleman who does not think the tubercle bacillus causes tuberculosis I would suggest that he make a few experiments and I think he will have no difficulty in convincing himself. In answer to the gentleman who says we have no serum treatment for any chronic disease, if such an argument had any weight and had been advanced a few years ago as to antitoxin, we would today have no antitoxin for diphtheria. It has been said that tuberculosis is a disease which gets well. Nobody doubts that. Laboratory men are directing their attention to the question of how it gets well. I have been surprised to see how much sympathy clinicians have with laboratory men. We ought to be the best of friends, and I hope that what we laboratory men are doing will in time be to your great advantage.

Dr. DE SCHWEINITZ—Dr. Cohen overlooked one point emphasized by Dr. McFarland and myself, namely, that tuberculin, as ordinarily prepared and used, is a solution of *some* of the products of the tubercle bacillus, but not of *all* of those products, as when the live germs instead of the dead are used. That has been my object and that of some others—to put to use *all* of those products or elements. The gentleman who does not believe in the infectiousness of tuberculosis says we ought to go back to fundamental physiologic principles. That is just what the laboratory men are working at.

Dr. ROCHESTER—There is not much to be said in reply. I think one or two things ought to have a little emphasis. One is that mal nutrition is one of the serious conditions associated with tuberculosis, and it ought to be fought as one of those things that interfere with the recovery of the patient. I do want to make a strong outcry against Dr. Herrick's heresy. He tries to underrate the work of laboratory men. I am not a laboratory man. I am a clinician. But during the last ten or fifteen years all the greatest work in medicine has been made through laboratories, and for clinicians to get up and say we ought not to pay attention to workers in laboratories is unpardonable in every way.

With regard to treatment, I reported a number of cases, and I feel that I ought to apologize to the Section for having reported upon one of the agents I used, namely, aseptolin. I think the profession ought not to use a remedy advertised as that was, and I wish to say that I used it at the request of a number of patients, and the results were as I stated them in the paper.

With regard to the remark of Dr. Tyson concerning the serum which he used—that the patients had a great deal of urticaria, and he had to stop the treatment on that account—the same thing occurred in my use of the Paquin antitubercle serum. It was not used long enough to say that it counteracted tuberculosis, for it produced too great pain. It produced actual dermatitis and swelling of the lymphatic glands, so that it had to be stopped. As to Vaughan's nuclein, some say it is not the proper thing to use; that it is unscientific. Now Vaughan's nuclein is not an antitoxin, but is intended to improve nutrition and the resisting power of the white corpuscles and blood serum. I have had results from nuclein which I have not had from any other remedy, and I shall continue to use it.

Dr. FLICK—It was necessary to be so very brief in my paper that I could only give results, and I fear I have been misunderstood in some of my statements. When I stated that we ought not to publish results as to cure in phthisis for five or six years, I meant cure, not improvement. In tabulating my cases I had that idea in mind. The use of iodoform and europhen in the treatment of tuberculosis is, I think, in line with the use of antituberculin, with a view to establishing immunity. I think this is the line along which a cure for tuberculosis will have to be found, for the very nature of the disease is such, as Dr. McFarland so well pointed out, that a direct cure is impossible. A cure can be found only along the line of immunity, and I believe that a cure along this line not only possible, but is within sight.

Dr. HERRICK of Cleveland—I had no intention of denouncing laboratory work, as might be inferred from the remarks of one of the speakers. But I find it difficult to accept all the conclusions from such work. I think free expression of opinion is justifiable. I am not able to connect the experiments with the results claimed.

Dr. BORLAND—In presenting my paper I did not and I do not underestimate the work of the bacteriologist. I did not wish to create that impression, for I value the bacteriologist as highly as any physician can value any specialist. My plea was mainly for those not engaged in bacteriologic work to give attention to the frequency of latent cases of tuberculosis, and thus save many valuable lives while laboratory experiments are going on. I would be the last man to decry experiments which would lead us to a means of securing immunity from tuberculosis, or to a specific cure for the disease. I have this to say about the medical world: We are twenty-five years behind the surgical world. The two great discoveries of the century are anesthesia and Lister's antisepsis. Now the surgeons are using antisepsis and the physician's are twenty-five years behind. We have external antisepsis. Why should we not have internal antisepsis?

Dr. S. SOLIS-COHEN of Philadelphia—Dr. Flick said that no case of tuberculosis should be reported until four to six years have elapsed, for no conclusion whatever can be drawn before the expiration of that length of time. There are a great many cases which get well under no treatment or any treatment apparently, and then get sick again, and that will go on indefinitely. For instance, a case of apparently acute tuberculosis came under my care eight years ago, in which the patient seemed to have recovered, but he returned to my office a few days ago nearly moribund. Now, that patient might have been reported

as cured half a dozen times had he come under the care of different physicians in different attacks. The idea of prolonging life, however, is not to be overlooked, and I think Dr. Flick may give his treatment less credit than it deserves from that standpoint. No disease requires so much investigation to prove the effect of treatment as does tuberculosis. The response of the individual to different methods of treatment varies so greatly that each case must be an individual study, and for the indications presented by that case different methods of treatment will have to be adopted. There are, however, certain fundamental principles which we are all so familiar with that it would be superfluous to dwell upon them.

Dr. Rochester has well called attention to the importance of fresh air, exercise and diet. I for one should insist at this time on the necessity for the pneumatic treatment in the form proposed and carried out so well by Waldenberg and those who have followed in his footsteps. All the cases which I have reported as having recovered under this treatment have held their recovery up to this date, some of them fifteen years. I have seen some cases in the practice of my brother which have held their recovery twenty-five or thirty years. So that if there is any definite conclusion to be drawn from results in individual cases, I certainly think the results placed on record by reputable observers in favor of this measure prove that it is far superior to others.

I think Dr. McFarland has done well in calling our attention to the fact that tuberculin does not cause reaction in healthy animals, but only in animals already the subjects of tuberculosis. He has called attention also to the late occurrence of toxemic symptoms in cases of tuberculosis. Those two points taken together would seem to indicate that if there was the possibility of the production of an antitoxin through influence acting upon any susceptible subject whatever, it would be produced in patients in the long course of a chronic disease. Now, the immune animals, such as the ass and horse, from which antituberculin serums are being sought, do not react to tuberculin, and therefore whatever is taken from them is not of the same nature. The antitoxin does not bear the same relation as the antitoxin of tetanus and diphtheria. I believe in susceptibility to the disease, and that there are immune human beings just as there are immune animals. Whereas the guinea pig will almost invariably succumb if inoculated with tubercle bacilli, antitoxin or not, and the horse and the ass will rarely die, so we have among human beings some who are guinea pigs and some who are asses. Our treatment must be directed toward changing the guinea pigs into donkeys, building up this vital resistance which will prevent the person from reacting to the tubercle bacilli or tuberculin. Whatever method will have that effect, whether diet, exercise, massage, drugs or anything else, is what we are to use, and not go in a will-o'-the-wisp chase after specifics. Now, the drugs which have been mentioned can all be used and have been used. The journals, the dispensatories, the text-books, are filled with lists of drugs which have been used in tuberculosis. When the reports are reliable, and from good men, and the drugs are not harmful, let us try their remedies.

Dr. Rochester spoke of the use of certain remedies for fever; my own experience is that the best remedy for fever in chronic tuberculosis is rest, with an ice-bag over the heart—the method of Bremer. Dr. Vaughan in his early experiments with nuclein also sent me some samples, which I used on a number of patients at the hospital, with much satisfaction to myself, but with dissatisfaction to the patients. Several of them complained of intense pain from the injection. One of those patients I have placed in the list of recoveries. The other patients were improved and passed from under observation. I believe there is a scientific basis for the use of various nuclein products (some are better than others), in the building up of the vital powers of the patient. I do not look upon it as a specific against tuberculosis or any other disease. I wish to thank Dr. McFarland, too, for the opportunity he gave me to test his antituberculin serum. I saw it produce considerable mitigation of symptoms. The two deaths which occurred in my practice were certainly not due to the treatment, because at the time the treatment was begun we expected the patients to die at any minute. One of them lived three months, the other lived a shorter time. But these patients, too, complained of intense pain.

In conclusion, I would like the Section to look up the works of Waldenberg and the advantages of pneumatic measures in the treatment of tuberculosis. Do not search for specifics, but build up the patient's vital resistance, and use whatever drugs are necessary for the control of symptoms.

DISCUSSION ON GOUT.

Dr. James Tyson of Philadelphia—I want particularly to refer to the diagnosis of gout. I feel quite certain that fully one-half of the cases diagnosticated as gout are instances of erroneous diagnosis. One of the conditions most frequently mistaken for gout is that peculiar deformity of the knuckles known as Heberden's nodosities. Heberden's nodosities do not mean gout. Heberden stated that they were not gout. But they are constantly said to be gout by practitioners. The nodes have not the same composition as those of gout. I agree with Dr. Stockton, that uric acid in the urine is by no means always an evidence of gout. Indeed, the man who has uric acid sediment will not have gout, and the man who has gout will not have such sediment—I mean in the shape of calculi. How shall we know gout? By the occurrence of two or three things: 1. An attack of true podagra. 2. The presence of tophi in the eyelids, etc. 3. Heredity. If you find a person with these manifestations, whose father or grandfather was undoubtedly gouty, you may again be justified in concluding that these conditions are gouty. It seems to me one or the other of these three facts must be found before you can say the case is gouty and hold to your diagnosis.

There is a point with regard to treatment which I believe has not been alluded to, namely, the continuous use of alkaline mineral waters between the attacks of gout. Gout can not be cured. Gout may, in the course of years, pass away. There must be a constant attempt to keep the symptoms in abeyance. It is treated with salicylates better than with any other remedy, but we can not do away with the continuous use of alkaline mineral waters, especially the foreign vichy. Citrate of potassium is a good artificial substitute. Of course diet is important. I must confess to using salicylate of sodium, also salicylic acid and sodium bicarbonate. I can support Dr. Wood in the statement that salicylate of strontium is easier on the stomach.

Dr. D. L. Rochester of Buffalo, N. Y.—The very scientific papers of Dr. Hutchinson and Dr. Stockton impress one with the idea that we have two distinct conditions, one of gout and one of uric acid. These two papers have pointed out the ways in which we are to examine our patient in order to treat them properly, and I simply rise to emphasize the points made in them.

Dr. Carpenter of Pennsylvania—For thirty years I have treated gout principally on the basis of hints which I got from Prof. George B. Wood, whose lectures I had the pleasure of hearing when a young man. I have noticed during this discussion, that no allusion has been made to one important fact with regard to gout, and that is the periodicity of its attacks. Years ago I noticed that it was likely to recur once or twice a year—spring and fall. There are other ways in which gout manifests itself periodically, one being gouty eczema of acute variety. I watched such a case, that of a worthy lady, for about sixteen years, who had attacks of true podagra or of eczema about once a year. The last year of her life she had no attack, and that suppressed outbreak of stored-up poison was followed in a few months by heart and other troubles and she died.

Having seen periodic manifestations of gout in the joints and in the skin, there is a third variety which I have been convinced of many years, namely, hay fever. The exciting cause may be some germ or irritant from the vegetable kingdom, but I believe the large majority of the people who are subject to hay fever are gouty. This question of the periodicity of gout not having been alluded to, I thought it desirable to have it spread upon the records as an important point in diagnosis.

Dr. H. A. West of Galveston, Texas—I was very forcibly impressed by the remark of Dr. Wood as to the comparatively few cases of true gout which had come under his observation. That has not been my experience. I have seen a good many cases of genuine gout. With regard to the etiology, I have seen cases in which I could attribute the gout to nothing else than the excessive use of nitrogenous food, especially eggs. I have observed gout from the same cause, excessive use of nitrogenous food, in butchers, and also in cooks. The necessity for regulating the diet has been fully insisted upon.

Dr. Woods Hutchinson of Buffalo, N. Y.—Exercise, exercise, and again exercise—training your patients as if it were the intention to get them into trim to run a hundred yards in ten seconds; get them up to the highest possible pitch of human development! On one point I differ, namely, the distinction and absolute separation between gout and lithemia and intestinal toxemia. One thing which Dr. Wood said I cordially agree with, that is that our knowledge of gout consists largely of what I think he called "crumbling expectations." We know little about it. I think I shall have to qualify my statement that we know nothing of rheuma-

tism except that two-thirds of it is gout, by the further statement that we know little about that. But we are in the way to learn something. One thing which we do not know is whether this peculiar ancestral reversion on the part of the metabolism cells begins in the muscle cells, or liver cells, or cells lining the alimentary tract, or the kidney. I think it unquestionably begins, in many cases, in the intestinal tract.

DISCUSSION ON PAPER OF DR. D. L. ROCHESTER, OF BUFFALO, ON "THE PROGNOSIS AND THERAPEUTIC INDICATIONS IN HEART DISEASE."

(*Vide* JOURNAL, Vol. XXVIII, p. 1207.)

Dr. J. B. HERRICK of Chicago—I rise to say a word for one method of treatment which has passed somewhat out of fashion—venesection. The benefit of this method has been brought home to me in three cases of cardiac dilatation where the dilatation was due apparently to fibrous myocarditis. The patients entered the hospital with extreme dyspnea, amounting to orthopnea, extreme cyanosis, edema, with feeble arhythmic pulse, feeble heart sounds, and with systolic murmurs believed to be connected with the mitral and tricuspid valves. In these cases, believing that stimulation of the heart would not do as much good as relief from the work which the heart was required to do, abstraction of eight to sixteen ounces of blood was practiced, and in all three of these cases with the most gratifying results, in one temporary, in the other two more permanent. So I would speak favorably of treatment by venesection in certain selected cases of cardiac dilatation.

Dr. H. A. WEST of Galveston, Texas—I would mention two factors in connection with aortic incompetency that are not always recognized, and not always considered as affecting the condition of the heart and its muscle. One of these is the continued hydrostatic pressure of the column of blood acting through the incompetent aortic valve upon the cavity of the left ventricle—a very important factor in producing dilatation. The other factor is the local disturbance of the circulation in the heart itself, depending upon the mechanical interference with the entrance of blood into the heart through the coronary arteries in consequence of the incompetent valve. These two factors are exceedingly important. They point to the rationale of treatment by rest as a means of decreasing the hydrostatic pressure; hence, also, the value of treatment by venesection, decreasing the volume of blood. This, taken with rest, meets very important indications indeed. The disturbance of the nutrition, the degeneration of the heart muscle depending upon the disturbance of the circulation in the coronary arteries is an exceedingly important factor and one whose influence it is frequently difficult to forsee. I have no doubt that it often explains the fatal result in cases that otherwise would be difficult to explain.

Dr. J. B. MARVIN of Louisville, Ky.—This paper contains lessons which many of us need to bear in mind. Preceding prognosis should come diagnosis. Certainly the time has passed when a man bases a prognosis on the mere presence of a murmur heard over the cardiac area. As the author has well stated, there are other factors to be taken into consideration besides the murmur, such as the condition of the peripheral circulation, of the arterial system, of the heart muscle itself—and of these three factors certainly the last is most important. A murmur may mean very little, but if it is taken into consideration with the other two factors it may mean a good deal. Another point which might be mentioned in connection with this paper is the fact that there are cases of what may be called acute dilatation, occurring, as indicated by Dr. Osler, in persons of middle age, and which yields most readily and most happily to rest in bed, to dietetic management, and to the Schott treatment. Other cases are more chronic, occur in older people, older not as we measure time necessarily, but older with regard to the integrity of the heart muscle, where there may have been valvular trouble and compensatory hypertrophy now followed by acute dilatation. Such cases do not give brilliant results from any method of treatment.

In therapeutics I must add one or two other things to those named by the author, for while in hospital practice those do sometimes yield most brilliant results, yet I must ask in addition for strychnia. I do not care so much for digitalis, but I would greatly dislike to be called to treat a case of cardiac trouble without strychnia. And I am satisfied that many follow our homeopathic friends and give too small doses. I want an appreciable dose, and I prefer to give it hypodermically, with increasing amount, starting with one-twentieth of a grain. I have yet to see a toxic influence from strychnia given in increasing doses by injection.

Dr. J. N. UPSHUR of Richmond, Va.—I rise to endorse what the gentleman has just said with regard to strychnia. To me it is *par excellence* the remedy and, as the gentleman has said, in full doses. It is the most honest of all remedies, giving fair warning of its ill results when its physiologic effects have been produced. To strychnia I would add one other remedy, nitroglycerin. It diminishes the resistance in the arterial system and enables the strychnia to stimulate the heart in a way to get the best results.

Dr. S. SOLIS-COHEN of Philadelphia—As I understand Dr. Rochester's paper, his purpose was to lay down the principal lines of treatment rather than enumerate all the remedies which might be used. I would go farther than the gentleman who has just suggested nitroglycerin. We might speak of spartein, of strophanthus, etc.; but what I would like to emphasize once more is the great satisfaction I have had with the method spoken of by Dr. Herrick, venesection. I think we of the younger generation, who were not brought up to bleed, have been entirely too much afraid of it. During the last ten years I have been resorting more and more to the use of the bistoury on proper occasions, and I am becoming more and more convinced that those of our predecessors who advocated venesection for relief of the heart, and for control of inflammations, knew what they were talking about. The advantage of the procedure was strikingly illustrated in a recent case in the Philadelphia Hospital. The resident physicians who have charge of my patients know that as soon as they have a proper case they are to bleed, without waiting for me. A patient with fibrous senile heart came into the hospital, cyanosed. As there was no time to send for me, the resident physician opened a vein, took away about sixteen ounces of blood, and the result was that the woman, who had come into the hospital almost *in articulo mortis*, rapidly improved and has been discharged. She is not well of her fundamental heart disease, but has been relieved from imminent danger of death and promises to live a number of years under proper hygienic management. If nothing else should come out of this discussion except the renewal of testimony in favor of the advantage of relieving the weak heart by taking out of the system blood loaded with toxins which can do no good to the patient, but only obstructs the free flow of the circulation, I hope at least that much will come.

Dr. WAINWRIGHT of Kansas City, Mo.—I wish to say one word with reference to the prophylactic treatment of cardiac lesions. I believe the profession is largely responsible for a great many valvular lesions because of lack of knowledge of what is now held to be causative of such lesions, and failure to diagnosticate their presence during the inflammatory stage. According to authority, 50 per cent. of all valvular lesions are accompanied in the beginning by inflammatory rheumatism, and I believe that if the conscientious physician would study the heart in all cases of inflammatory rheumatism he would be able to prevent disease of the valves. I speak for rest in prophylactic treatment. Rest will prevent those extensive changes in the valves which we are now frequently called upon to treat. When it comes to the treatment of existing valvular lesions, it seems to me physicians are too apt to treat the condition before treatment is indicated. Take the average practitioner throughout the country, when he hears a cardiac murmur he thinks it is an indication for digitalis or strophanthus. He interferes with the laws of nature when nature is compensating perfectly for that lesion, and by his interference he disturbs the compensation and brings about dilatation.

Dr. J. F. JENKINS of Michigan—I have heard a good many things attributed to the neglect of the medical profession, but this is the first time that I have heard of the medical profession making patients have heart disease. In fact I do not think there is a case of rheumatic endocarditis in which the doctor has had anything to do with inducing the disease. In all probability the disease was there before the doctor saw the case. In fact, cardiac disease is one of the commonest affections produced by rheumatism and I should dislike to see the physician accused of being the cause of it.

Dr. ROCHESTER—As Dr. Cohen said, the paper was devoted to the prognosis and therapeutic indications rather than to an enumeration of all the drugs. The therapeutic indications which I spoke of were the relief of peripheral obstruction and improvement of the musculature of the heart and arteries. The various methods by which this might be secured were not entirely gone into, but merely touched upon. I am glad venesection has been mentioned, for I am one of the younger members of the profession who practice it when the time comes for it. The indications for venesection pertain to failure of the right heart. I did not speak of disease of the arterioles of the heart especially, but included those with the arterioles of the rest of the body. The use of strychnia and nux vomica is one of the hobbies of the reader. A great many physicians

V 2
189

are frightened when I tell them that I have frequently given a drachm of tincture of nux vomica at a dose, three times a day. Strychnia I have given in the same proportion, after gradually working up to that dose. The use of strychnia and nitroglycerin alternately simply produces the same condition which we can bring about by baths and exercise—dilatation of the arterioles, etc. If we can bring about these effects without introducing poisons into the body, we can do much better for our patients, and I want to enter a strong plea here for the employment of exercises, such as are used in the Nauheim treatment, and for the use of baths whether they do or do not include salt or carbonic acid. Use baths, rubbing of the skin, and all measures which we can without drugs, and when these fail we can fall back on drugs.

DISCUSSION ON DR. F. A. PACKARD'S PAPER "TRICHINOSIS IN THE UNITED STATES."

(*Vide* JOURNAL, page 59.)

Dr. CHARLES STOCKTON of Buffalo, N. Y.—I agree that this disease is often overlooked. I feel convinced that I have myself overlooked it because after having once recognized it I could look back with a more or less clear vision upon previous cases and come to the conclusion that I had overlooked it several times. I think the point to which Dr. Packard has called attention should be borne in mind, and I hope he will allow me to add to this important sign those of sweating and edema. It seems to me that if we add these two signs to the other two, it will constitute a picture which can not well be overlooked.

Dr. A. P. OHLMACHER of Cleveland, Ohio—I wish the author had added something about treatment. The trichina is killed by lime salt. Now, if in some way lime salt could be got into the blood, would it not get rid of the trichina?

Dr. PACKARD—I have mentioned sweating. I would put with it as of equal value, thirst. With regard to treatment, this man got salicylate of soda during his stay in the hospital, principally for the reason that it was cheap and in the doses given it was harmless. The only other treatment which he received was in the way of cathartics, calomel, salines, and an occasional dose of castor oil. With regard to giving lime, the trouble is that it is too late. As soon as the trichina becomes encapsulated it can do no harm save by being eaten by the rat or pig.

DISCUSSION ON PAPER OF DR. S. SOLIS-COHEN, "THE TREATMENT OF EXOPHTHALMIC GOITER AND OTHER VASOMOTOR ATAXIAS."

(*Vide* JOURNAL, page 65.)

Dr. C. F. HOOVER of Cleveland, Ohio—I may mention the case of a woman with marked scleroderma, bronzing of the skin, leathery binding feeling of the hand, inability to close the hand on account of the scleroderma, cessation of menstruation, irregular heart. There was no sweating, no exophthalmus. Within four or five days after commencing thyroid feeding the cardiac rhythm was perfectly restored; in the course of three or four weeks menstruation returned, and I was astonished to find that the scleroderma and bronzing entirely disappeared.

Dr. S. SOLIS COHEN—I do not know in what way the thymus gland administered in these cases acts. The thymus and the adrenal extracts should be given tentatively. I get the best commercial preparation which I can find. I give tabloids of five grains each, beginning with one a day and increasing until in some cases I get up to six a day. In other words, testing the susceptibility of the patient in each case, first dividing the one tabloid in three parts, giving the three parts in the course of the day, and finally in some cases going up to two tabloids three times a day. Dr. Owen has used much larger doses of thymus, but I have begun with the smallest dose, and in some instances have run up to 30 grains a day, or as far as I think the patient will stand it, both of the thymus and adrenal extract.

Dr. HERRICK of Cleveland, asked whether other medicines were given, and Dr. Solis-Cohen replied in the negative.

DISCUSSION ON PAPER OF DR. HENRY BEATES, "THE USE OF DIGITALIN WITH REFERENCE TO DOSE."

(*Vide* JOURNAL, Vol. XXVIII, p. 1209.)

Dr. HERRICK of Cleveland, Ohio—We are coming to the region of therapeutic agents for the treatment of disease, a region of great skepticism, great doubt with regard to specifics and special agents. This paper is valuable for what it has given. I think, however, that there are some problems involved in the administration of digitalin. As the author has intimated, its action is through the pneumogastric nerve, and it is applicable to a certain class of cases. Would the Doctor administer digitalin in inflammations of the heart? I think the common custom among physicians is to give digitalis in any heart disease. Heart disease: digitalis! I would put in a word of caution; never give digitalis in inflammation of the heart. But in other conditions, through the pneumogastric nerve, I think we may somewhat limit the region of its activity.

Dr. BEATES—As to whether digitalis should be used in inflammation of the heart, if the Doctor means simple inflammation or conditions in which there is active inflammation of the heart, it certainly should not. If, however, he includes in the term inflammation the consequences of the acute condition after the latter has subsided, I would say that I myself would not then use *digitalis* because it is complex; I would not use *every* digitalin, because they are so different, but I would use *this* digitalin. In acute inflammations of the heart the drug is certainly contraindicated, but in the results of the acute forms of inflammation of the heart I would certainly urge this particular digitalin as a therapeutic measure.

DISCUSSION ON PAPER OF DR. J. M. ANDERS OF PHILADELPHIA, "MYXEDEMA WITH REPORT OF TWO CASES."

(*Vide* JOURNAL, page 63.)

Dr. RUSSELL—A mistake in diagnosis is frequently made, even in pronounced cases. In the Howard Hospital a very marked case in all its characteristics had been treated, as long as a year, for chronic gastric catarrh as well as liver trouble instead. A knowledge of the clinical features of the disease is essential to diagnosis, a fact which should be better known to the profession. Within two years I have seen a case very similar to one of Dr. Anders. The patient was a woman who had been treated about two years for parenchymatous nephritis. The urinary changes were markedly pronounced, but at no time were there cardiac changes or edema, and it was only as a tentative treatment which the thyroid was tried, not so much with the idea that there was a myxedematous complication. The result was eminently satisfactory, for the urine has been normal for a period of eighteen months. The case at the Howard Hospital rapidly improved under thyroid, but at no time were we able to administer more than five grains of thyroid extract three times a day. Within seven weeks the patient lost some thirty pounds, and has been in every possible way benefited.

SELECTIONS.

On the Question of the Removal of the Second Ovary in Ovariotomy.—Dr. D. Thomson relates his experience in exemplification of the above question, saying: I firmly believe there can be no fixed defined and inalienable rule in these cases. I remember years ago removing a cystic ovary from a young woman, unmarried, leaving the other, which was enlarged and tender. She made an excellent recovery, but when well enough to be discharged and get about she began to complain of symptoms pointing to the ovary which was left behind, and she was repeatedly sent to me to know if she had not another tumor coming and if it was not advisable to have another operation. I saw no reason for it and refused, and this young woman is now perfectly well. There was pain and tenderness, but I did not consider these sufficient to justify another operation. One can not avoid the feeling that in this case the second ovary might have been removed had I been strongly impressed with the need for it at the time of operation. We might have had this case to swell the number of double removals, and the tender condition and enlargement would have been employed as arguments in justification. I know of a case of cyst of the broad ligament which I was about to remove five years ago, but which, owing to the very alarming symptoms occasioned by the anesthetic, I was obliged to desist from doing when just about to enucleate it. The operation was immediately stopped and the abdomen closed. From that day to this the cyst has not been enlarged; indeed, it underwent some degree of diminution. I have seen the patient at intervals of a few months since and she has continued very comfortable and able to attend to her business. During the time I had the patient

under observation previous to the operation the cyst had been increasing, and I only decided to operate because of the disturbance and pain it was causing in its neighborhood, as well as rendering the woman unfit for her duties and giving her great general discomfort. Its presence does not now cause these symptoms in anything like the same degree, and, as I have already said, she attends to her daily duties, which are of an arduous kind. Why the cyst ceased to increase is another question, but it may have been *in some measure* due to the fact that I made her rest absolutely for six months. I accidentally discovered a cyst of the ovary, when attending a woman four years ago for another matter. It had not increased when I last attended her a few months ago, and she at present suffers only a little from it. She does not know of its existence. Why should she so long as it gives such slight trouble and she is quite able for her duties? She has had two children since I discovered the cyst, and if it has remained *in statu quo* for four years (and perhaps for four years previous to that) may it not remain so for four, or even fourteen, more? I may also instance the case of a young married woman in whom a tumor (cystic) of one ovary has existed to my knowledge for years. It has at times caused a good deal of suffering, and on one occasion I almost decided to remove it. Several months of absolute rest, however, with some treatment, helped her greatly, and she has been able to attend to her household affairs with a considerably greater degree of comfort than previously. I have known of the existence of this cyst for six or seven years, and it does not increase.

The advocates for removal may say that it would be better to remove the organ than for the woman to undergo the trouble, anxiety and suffering of a second operation, with its consequent risk and expense. The risk is small now, thanks to progress made in surgery during the last quarter of a century, but there is a risk, and it ought to be avoided, to say nothing of the other concomitants of an operation. But if there is a reasonable hope that the ovary may not get worse or may recover, I think the woman, especially if a young one, ought to have a chance and the ovary should be left, and I think it may be fairly said that the cases cited show that ovaries to some extent diseased may be left sometimes with a very fair prospect that they may not only not cause increased trouble in the future, but that they may remain stationary or even recover. If, then, some diseased conditions of the ovaries remain quiescent for years, improve and even get well, we ought not too hastily to conclude that operative interference is necessary, but should keep our patients under observation and treatment. I am confident that some operations may be avoided by this plan, and the subjects of the disease be enabled to pursue their daily duties with comfort.—London *Lancet*.

Clinical Experience with Formaldehyde.—In the *New York Medical Journal*, January, Dr. M. S. Alexander states that he has used this drug in whooping-cough and numerous other conditions with gratifying results. It should be remembered that formalin solution has no caustic properties. It does not hurt the instruments, not even as much as blunting the edge of the cutting instruments. The same solution was always used for irrigation when the dressing of wounds was changed; this too gave such satisfaction, that it has been altogether used in a great many operations. "I have used it altogether in my practice for almost a year. I have no more need for corrosive sublimate or carbolic acid. I wish to emphasize the fact that formalin does not attack metals at all. It is best adapted for antiseptic solutions (1 to 500) in which to keep instruments. I have had no alarming results with formalin locally; indeed, in cases of chancroid and chancre, the pure (40 per cent.) was applied without any bad results other than pain, with the benefit of rapidly healing the ulcers with a single application. I have never failed to get better results from it in skin troubles than from any other remedy. I use it by blowing it into the skin by a compressed air sprayer.

"I have cured an old case of pruritus vulvæ that had been treated by many different specialists for three years. In all affections when any of the old disinfectants, such as carbolic acid, corrosive sublimate and many others cause trouble by irritation and poison if not applied very carefully, this is all lost sight of and overcome by the happy and safe use of formalin.

"Cases of whooping cough are treated successfully by spraying with an atomizer three times daily, using a 1 per cent. solution for fifteen minutes. I have never had an opportunity to use it in scarlet fever, but no doubt it would prove of great utility in all infectious and contagious diseases for the following reasons: 1. It has extraordinarily active antiseptic power, similar to that of corrosive sublimate; 2. It attacks only the substances of the contagious material, leaving unattacked the articles treated, whether organic or inorganic; 3. It is very readily employed under all circumstances either as a liquid or as a gas. Another marked advantage of the vapor of formalin is that its specific gravity closely approximates that of air, so that there is no difficulty in keeping the atmosphere of an inclosed space uniformly impregnated. For this reason it suggested itself to me as a happy remedy in catarrhal troubles. In hay fever it surpasses all other agents known. I use a 0.5 per cent. solution as a spray, and by taking a drachm phial and filling it with a 2 per cent. solution and allowing the patient to inhale the fumes, I can come as near curing the most obstinate forms of catarrhal troubles as by all other means known. The fumes seem to reach portions that can not be penetrated by the spray or douche. I treated fifteen cases of infantile diarrhea with only one death. Half a grain to a grain and a quarter at a dose every two hours. In conclusion I will say that I can clincally recommend formalin as being in the lead among intestinal antiseptics, and far superior to all other agents known in its sphere."

PRACTICAL NOTES.

The Favorable Effect of Hydrastis Canadensis in Bronchitis is announced by Saenger (*Cbl. f. In. Med.* 17, 1897). The cough diminishes, expectoration becomes easier, secretions lose their putridity, while it is superior to opium or morphin in its soothing effect in such cases and even in phthisis, as its effect is more powerful and lasts longer.—*Nouv. Remèdes*, July 8.

Massive Injections of Artificial Serum in Extensive Burns have been found remarkably beneficial in combination with antiseptic and soothing dressings, by Prof. Tommaselli of Palermo. Two observations are described in the *Semaine Méd.* of July 21. In one case more than two-thirds of the front of the body was burned. The first day 250 grams were injected, increasing to 500 the fourth and continuing this to the nineteenth day.

Formol in Dental Surgery.—Didsbury announces in the *Journ. de Méd. de Paris* of July 18, that it has been his experience that formol applied at once to the cavity, when the pulp of a tooth is removed, and hermetically enclosed, renders the extraction of the nerve unnecessary. Ten cases in twelve proved absolutely successful. The pain is severe for four or five minutes but then passes away. He also finds formol efficient in deodorizing carious cavities.

The Omentum Used to Close Perforation in the Stomach from Gastric Ulcers.—Prof. H. Braun has thus treated two cases with success, and recommends the method when the tissues are too friable to suture alone. In one case the wall was perforated and extremely thin; to cover it he drew up a thick fold of the large omentum and sutured it over the spot, before commencing his gastro-enterostomy. The operation was completely successful and the woman is in good health now, three and

V 2
189

one-half years since. Bennett also reports using an omental plug to close an otherwise intractable opening in the stomach. —*Cbl. f. Chir.*, July 10.

Iodoformed Ether in Catarrhal Metritis.—Doleris recommends touching the cervical cavity with a cotton pad dipped in iodoformed ether. The ether causes the muscles of the cervix to contract and empties the glands of their infected mucus, while the iodoform disinfects. He has been very successful with this method, the only one which completely evacuates the glands of their contents.—*Nouv. Remèdes*, July 8.

Thyroid Medication in Fractures.—G. Gauthier has found that fractures in which consolidation does not promptly occur, can be favorably influenced by administering thyroid extract. He reports two cases thus treated, and states that the successful consolidation took place rapidly and was complete, after the failure of other treatments, for 110 days in one case and three months in the other. He urges others to experiment in the same line, which was indicated by the success of the thyroid extracts in the development of bony tissue in myxedema.—*Semaine Med.*, July 14.

Large Doses of Ether in Uremic Dyspnea.—Lemoine and Gallois report great benefit derived in acute nephritis, congestion, etc. (except where the uremia is due to arteriosclerosis), from hour to hour doses of 2 to 3 teaspoons of ether in sweetened water, or alternating it every third hour with 2 to 3 cm. injected subcutaneously. In some cases 300 grams *pro die* were administered without inconveniences. Copious diuresis was induced, the pulse became stronger and quieter, the respiration deeper and fuller.—*Wien. klin. Woch.*, July 8.

Substitute for a Suspensory.—After shaving and disinfecting the skin, the assistant seizes the lower part of the scrotum, the patient in the decubitus dorsal, and draws it up tight, the testes settling down close to the inguinal rings. Around the scrotal pedicle thus formed between the hand of the assistant and the testes, a strip of very adhesive sparadrap is applied, 3 cm. wide by 75 long, compressing the scrotum to the size of a thumb in a horizontal ring, two other strips are applied over it and three more just above and half overlapping it. In acute gonorrhea, with or without epididymitis, this compressing ring will be found more effective than a suspensory, especially if the patient keeps his bed. After the first half hour it ceases to be felt. As the tumefaction subsides, additional circles can be applied above it.—K. Gerson, Berlin, *Semaine Méd.*, July 21.

Cardiac Syncope in Great Altitudes.—A correspondent of the London *Lancet*, in explanation of the mountaineering accidents in Switzerland, eliminates as causes, at least among the chief, loss of balance, misplaced footing and recklessness. He even turns somewhat coldly from the phrase, "accident due to misadventure," as explaining the disasters expected to befall the foolhardy climbers. He alludes to the many grave considerations which loom up in such enterprises as the Jungfrau Railway with a height of 12,000 feet above the sea level, and refers as well to a congress of the Swiss faculty held at Arona, where an impressive warning was given to travelers "not to venture on rapid ascents above the snow line without a physician's sanction."

An Unusual Complication of Lithotrity.—White (*Lancet*, July 17) reports the case of a man, 52 years old, who came under observation for the removal of a vesical calculus of many years' standing. In the course of the operation of crushing the lithotrite jammed, with the blades three-fourths of an inch apart. A surgical instrument-maker was sent for, but he was unable to liberate the blades, which were too far apart to allow of the withdrawal of the instrument. Suprapubic cystotomy was therefore performed, and after the removal of the calculus the blades of the lithotrite were protruded through the wound, placed in a vice and pressed together until the female blade fractured. The male blade could now be driven home and the instrument was removed. Had the vice failed preparations were made to file through the projecting end of the male blade. The bladder could not be distended, owing to the presence of the lithotrite in the urethra, but the use of a large rectal bag removed all difficulty of reaching the bladder. The stone, with the crushed débris, weighed an ounce and a half and was a typical calcium oxalate calculus. The lithotrite was an old one that had seen much service.

Occluded Vermiform Appendix.—Dr. Arthur Latham exhibited before the Pathological Society of London a vermiform appendix which had been removed from a man, aged 46 years, who had died from lobar pneumonia. There was no history of any symptoms connected with the appendix having occurred during life. The specimen was nine centimeters long and considerably dilated throughout its course. There was no comunication between the appendix and the cecum, the lumen of the former having been obliterated at its junction with the cecum by adhesive enteritis. The appendix was completely filled with numerous small bodies which had the appearance of ova. The largest of these was about the size of a dried pea. On microscopic section they showed an irregular fibrinous structure, which in places was somewhat laminated. They did not give a mucin reaction and stained readily with acid dyes. The wall of the appendix was irregularly honeycombed owing to pressure exerted by the above bodies. It was further thickened, and on section showed loss of mucous membrane and also of lymphoid tissue, possibly due to membranous enteritis. He had been unable to find any similar case on record.—London *Lancet*.

Radiant Heat in Ulcers of the Leg.—Dr. Colleville, professor in the Rheims School of Medicine, treats ulcer of the leg by exposure to heat without any very elaborate apparatus. All that is required is a square plate of metal which will stand heating, and a Bunsen burner. The blue flame of the latter impinges on the metal so as to bring it to a dull red heat, and the ulcer is exposed to the action of this at a distance of about ten inches, the rest of the limb being protected by bandages. The temperature is about 45 degrees C., which is easily borne, and the flame is regulated so as to maintain this temperature at the wound during the whole of the sitting, which lasts for from twenty minutes to an hour. At the conclusion the surface is found to be glazed over, large granulations being visible through the semitransparent coating. It is best to leave the ulcer exposed to the air for some time, and when it is dressed care should be taken that its surface is not touched by the aseptic gauze or other material used. Some improvement is generally experienced by the patient even after the first sitting, and cicatrization is completed in from five to twenty-five applications. In the latter sittings, when the ulcer is nearly healed, a more moderate degree of heat may be employed. Where gas is not available the heat of the sun or that of a fire may be utilized. Dr. Colleville attributes the beneficial effect of this method to the combined action of heat, light and ventilation.

A New Method of Treating General Suppurative Peritonitis.—Finney (Johns Hopkins Hospital *Bulletin*, July) reports five cases of general suppurative peritonitis (including one of typhoid perforation) successfully treated by a new method. The same procedure was followed in a sixth case, and although the patient was at the same time *in extremis*, life was prolonged for thirty-six hours. It is not claimed that the principle involved in the operation is a new one but only that the manner of its application is original. The operation consists first in a sufficiently long incision to admit of easy access to all parts of the peritoneal cavity. Next the coils of small intestine are quickly withdrawn, beginning with the worst coils.

All or as much of the small intestines as is necessary is removed and placed outside of the abdomen and covered with warm gauze or towels. Then the peritoneal cavity is thoroughly and systematically wiped out with large pledgets of gauze wrung out of hot salt solution, particular attention being paid to the pelvic portion. In some cases it may be well in addition to flush out the cavity with warm salt solution, but this is rarely necessary. Next the small intestine should be systematically examined loop by loop while still outside the abdomen and rendered macroscopically clean by wiping with gauze compresses wrung out of hot salt solution. It is necessary to wipe with considerable force at times in order to remove adherent flakes of partly organized lymph. This should be done thoroughly and conscientiously, as upon it depends in a large measure the success of the operation. The cleansing process is facilitated and the shock of the operation is lessened if the wiping of the intestinal coils is carried on under a constant irrigation of warm salt solution. After being cleansed macroscopically of all foreign material, pus, feces, lymph, etc., the intestines should be replaced in the abdomen, the worst or sutured coil being the last or most superficial, in order that it may be the better drained by being packed about with gauze if necessary. The abdominal wound is then tightly closed, just enough room being left between two sutures for the gauze drain. If there are any evidences of distension or pain the Paquelin cautery should be thoroughly applied to the abdomen and the bowels moved early by calomel in broken doses, followed by salts and a turpentine enema. An experimental study by Elting and Calvert (Johns Hopkins Hospital *Bulletin*, July) of perforative peritonitis submitted to the foregoing treatment showed that mere mechanical irritation of the peritoneal surfaces will lead to the formation of adhesions; that peritonitis in dogs caused by a perforation of the intestine is of an intensely hemorrhagic character and if left to itself rapidly proves fatal; that generalized peritonitis of this character in dogs can be cured as late as six and a half hours after the operation by the cleansing method described, and that mere closure of the perforation, without this cleansing operation will rarely if ever cure a case of generalized peritonitis in dogs.

The Sclerogenic Treatment of Tuberculous Affections.—Sematzky has been carefully investigating this subject, which was first introduced by Lannelongue of Paris in 1891. His method of treatment consists in the deep injections of the chlorid of zinc around the diseased part. During the years 1893-96 thirty cases of every variety of tuberculous disease were thus treated by him. From these, however, ten, the observation of which could not sufficiently be carried out, must be deducted. Of the remaining twenty, in ten cases highly satisfactory results were obtained, in seven fairly good ones, and only in three no effect whatever resulted. It is noteworthy that the presence of pulmonary tuberculosis greatly reduces the chance for this local treatment. The solution used by Dr. Sematzky for these injections was of 1 in 10 strength, and according to the age of the patient, from seven to ten drops were injected in a number of places (from twelve to twenty) around the periphery of the affected area. As regards the form and technique of the operation he, on the whole, followed the rules laid down by Professor Lannelongue in his first detailed communication on the subject to the Academy of Sciences (July 7, 1891). In some respects, however, he was forced by experience to modify them. For instance: 1. As to the time of repeating the injection, he did not wait as long as three weeks, as was recommended by Professor Lannelongue, but performed a second injection as early as on the seventh or even third day after the first injection, being guided by the indication if the pains did not cease within that period. 2. The administration of anesthetics he regards as quite unnecessary in adults, and even in children the operation can be easily done without them, since the pain is merely that associated with all subcutaneous injections; indeed, they were slight and fugitive in character in almost all cases of his observation. 3. By observing rigid aseptic precautions, the appearance of swelling, redness and signs of any inflammatory reaction, as described by Professor Lannelongue, taking place in the vicinity of the injected area are avoided. Dr. Sematzky was accordingly able to employ an immobile dressing immediately after the injection, which proved to be exceedingly useful. The skin was first covered with collodium elasticum or traumaticum, and a solution of silicate of potash served for the immobile bandage. Professor Lannelongue's statement that this mode of treatment has no effect, or little, on the general health, we find so far fully confirmed by Dr. Sematzky's record, but in the matter of the action of chlorid of zinc on tuberculous tissues he greatly differs from the first-named observer's opinion. He acknowledges that it gives rise to a condition of sclerosis, but what is fatal to the existence, or at any rate paralyzing to the activity, of the bacillus is, according to the writer, the great antiseptic power of which that drug is possessed. At the conclusion, he remarks that this method of treatment, on account of its being very simple and easily accessible to every practitioner, deserves far more attention than it has as yet received, and if employed at an early period, and especially while the formation of granulations sets in, good results will always follow.—London *Lancet*.

Pathology of Morvan's Disease.—In view of the recent death of Dr. Morvan, the following interesting review of the latest status of pathology of the disease that bears his name will be opportune. The Paris letter-writer of the *Medical News* states, that Marinesco and Jeanselme have made public their researches on that disease. He says that it has until recently been the custom in France, to always regard the disease as an abortive, incomplete, atypical form of syringomyelia. In the East, especially at Constantinople, the similarity of the symptoms ascribed to Morvan's disease, especially its completely anesthetic mutilating panaris, and the fact that Morvan, in a country district of less than 50,000 inhabitants, found some fourteen cases of it, led them to suspect indigenous but deteriorated forms of leprosy. There, where leprosy is so common and its varying characters so familiar, the thought does not seem so strange as it would farther West. Not long ago, Zambuca of Constantinople found, in what was symptomatically a typical case of Morvan's disease, the cavity in the cord which would be expected in syringomyelia, but he found, in addition, in the broken-down material of the cavity, Hansen's lepra bacillus. This attracted a great deal of attention and even led to some doubts as to the etiology of even the more typical cases of syringomyelia.

Marinesco reported the careful autopsy of a typical case of Morvan's disease on which Charcot, in 1890, based one of his clinics, while Jeanselme reported the necropsies of two cases of the disease made in Bretagne, where Morvan's original study of the disease was made. Marinesco found the usual lesion of syringomyelia, a cavity in the cord, more or less triangular in shape, in this case, and extending from the sixth cervical to the sixth dorsal roots. The part involved was almost entirely the left posterior horn, the anterior horn being left almost completely intact. The interesting aspect of the pathologic anatomy for Marinesco lies in the fact that lesions of the left posterior horn should give the trophic troubles incident to Morvan's disease, localized entirely in the left hand. The inference is that the the medullary lesions of Morvan's disease have their seat in the posterior horns, and that it is here, as a consequence, that the trophic centers for the integumental and skeletal tissues of the extremities are to be found. A careful bacteriologic investigation did not disclose the presence of bacilli. The cavity in the cord was, as is usual in syringomelia, the result of a gliomatosis of the periendyma, the process seemingly starting in the canal, and spreading to the posterior horns. Jeanselme reported that he had not been able to find bacilli in the anesthetic spots, either over or under pigmented, as they accur in Bretagne, the home of the disease. As Hansen's bacillus is not often found in the trophic lesions of leprosy, however, Jeanselme did not consider that he could base any satisfactory conclusion on his negative results.

V 2
189

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SATURDAY, AUGUST 21, 1897.

POLITICS AND THE MEDICAL PROFESSION.

Whatever may be one's private opinions as to public questions, to whichever party he may have belonged in the past, it is clear to all independent intellects that there are other duties to one's fellow-men and to the future far more imperative and binding than allegiance to any political party—so far at least as such parties are at present constituted and used. Both great parties in American politics have at times fallen away from their principles and have wallowed in such bogs of corruption that they have nauseated their best members into a condition of alienation and independence, or at least into one of irritation and half contempt. One votes as he does now-a-days not because he likes Cæsar less, but that he likes Rome more; not because he believes much in the men, their acts or principles, on the ticket, but because he believes rather less in the men and their doings whose names are on the other tickets. It is too frequently a choice between two evils, in which one has some difficulty to determine which promises or rather which will fulfil the least evil. All of this is not, perhaps, wholly to be deplored; it has many advantages, not the least of which possibly are a more intelligent conception of and participation in government affairs; a use of parties and partizanship as mere instruments and tools for purposes beyond their surmise; and a habit of independence which may come in time to control the corruptionists. When these schemers and bribers and hoodlums, "in it for what it is worth," are dictating legislation and controlling law for their unscrupulous selfishness, men who have better purposes in life may be not only excused but encouraged to put in such delegates and lawmakers as will protest against abuses and use their offices for the public good.

Beyond all question things have come to such a pass that for medical men matters pertaining to professional and sanitary welfare must henceforth outweigh all considerations of partizanship. Questions of tariff, whether for revenue or for protection, questions of currency, etc., are infinitely unimportant in comparison with questions of professional progress and the health of the people. It is a shame for medical men to sell themselves in future for the advantage of politicians and commercial interests, while the far higher and more vitally important questions of scientific advance and the cure of disease are utterly neglected. It is our inescapable duty henceforth to judge of men and parties from the professional standpoint, and to make our power felt with administrators and legislators for purposes other than those represented by lobbies and bosses.

There are several methods whereby medical men can influence their administrative and legislative servants: 1. The first and most important is by corporate action, resolutions, committees, etc., through medical societies. Strange as it may seem, this, by some physicians, is considered unprofessional and *ultra vires*. The very thing we should do, that precise method of making our influence felt which is most effective and most imperatively demanded is, wonderful to say, actually the thing at which we balk and stop. No matter what disgrace to medicine may be threatened, no matter how clear the professional duty that confronts us, there are today not a few of the so-called leaders—professional tories and aristocrats, they might be termed—who say, "Oh, yes! It is all a miserable shame, but *non possumus*! Our organization gives us no right or power to go into politics." Bah! This is the voice of laziness and cowardice; it is not the way of scientific advance or of the cure and prevention of disease. Medical societies have not only the right and power, they have the inobviable duty laid upon them, shirk it and deny it as they may, to make their influence felt in all public questions relating to the public health. The work of the British Medical Association and of its parliamentary and other committees in eradicating abuses and in instituting reforms, gives the lie to our pusillanimity and, by example, illustrates what may be done by men whose motives are pure and whose bravery puts their motives into action. Every American medical society from the smallest to the largest is under the most stringent obligation to make matters of the public health its most direct concern. Each one, and especially the AMERICAN MEDICAL ASSOCIATION and the Medical Congress, should pass resolutions pertaining to bad laws proposed or to good laws

that should be proposed, in reference to medical education, quarantine, health-protective measures, etc., and should see that copies of these resolutions are placed in the hands of every legislator and administrator to whom they concern. Only thus shall we make our professional will and power known, and in becoming known it shall bring about reform and social education. Our organizations should also appoint committees, and see that these committees do their work to bring to the consciences and consciousnesses of the public officials their duties as to the prevention and cure of disease.

2. Not only by means of our organizations can we further our cause, but hardly less effective, if strenuously carried out, would be the work of individuals of the profession should they try to influence their lawmakers and administrators in a private way. If these men are known to us personally, by all means protest and advise by word of mouth. Incalculable good could be done so. If the powers that be are not our acquaintances or patients, there remains the letter-carrier to help us. And a powerful influence is the written letter! When a vicious piece of legislation is proposed, or when good measures are neglected, we should write to legislators and governors and mayors in condemnation or in commendation. Many a shameless bit of medical jobbery is smuggled into law simply because the men with power hear only the quacks' side and not a word is uttered by us who are the appointed guardians of the nation's health. The few quacks combine, hire a lobby, write a thousand letters, appoint committees, personally intercede and win the day, while we, who are 100,000, meet in a thousand societies, local, State and National, and talk about headaches, sprains and sore toes, but never a word about prevention or cure of the common professional and social miseries that afflict and murder millions. The profession by such silence is not only renegade to its humanitarian function, but it is renegade to its own self-interest. A man may not always be his brother's keeper, but a physician is always so, and when he denies or neglects the fact he is a shirker and at heart and in fact an enemy of his own guild.

While we acquiesce in silence, physicians who value their selfish aims and interests above those of the world and of their profession, form a compact and make a raid on the public treasuries for endowments and "divvies" for the benefit of hospitals, dispensaries and medical colleges founded and carried on not for the public good but for the benefit and profit of the lobbyists. All the time there is not one in a thousand of the epileptics of the land cared for, his life turned from a curse to a blessing by the one sure method which we all know. Is this medicine? Is it humanity? A hundred such examples of abuse and disgracefulness arise spontaneously in every reader's mind, and need no further listing. The antivivisectionists, the meat-sellers and milk-dealers who are only kept from sewing the seeds of disease by inspectors and legal control, go on with their infamous traffic because, forsooth, we do not care or because the stoppage of the misery is *ultra vires!* Can a more flagrant example of professional cowardice and stultification be cited? Shall it go on forever, while eternally postponing we sing the old woman's song:

"Consider, good cow, consider!"

THE COMPARATIVE PATHOLOGY OF MALARIA.

Of late years there have been described by various investigators certain forms of parasitic blood diseases in animals that undoubtedly correspond to the now quite well understood malarial diseases of man.

BABES[1] of Roumania, was one of the first to investigate the occurrence of parasites in the red blood corpuscles of cattle. It concerned an acute febrile disease, occurring in the summer, lasting from four to seven days, and characterized by a hemoglobinuria that made its appearance on the second or third day and which was constant in the fatal cases. Postmortem there was found hemorrhage in the kidneys and in the walls of the stomach and intestines, and acute splenic swelling. The red blood corpuscles contained one or more parasites shaped like cocci, but BABES could not follow the stages of development of the parasites, whose exact nature was not established.

The most important investigations concerning this disease have been made by THEOBALD SMITH[2] now of Harvard University, whose studies of Texas fever have called forth universal admiration on account of clearness, accuracy and penetration. In the acute form, which usually occurs in the summer, there is fever, anemia and hemoglobinuria, the disease being generally fatal. The postmortem shows acute splenic swelling and hemorrhage into the substance of the kidneys. The red blood cells show, in the fresh preparations, ameboid protoplasmic masses, often paired and bean-shaped; in the fixed and stained preparations red corpuscles laden with chromatin fragments are also found due to the destruction of embryonal cells. The chronic form occurs in the autumn and may pass unnoticed, hemoglobinuria being rare; the parasites are usually round, small-like cocci. The disease can be produced experimentally by inoculation of the blood of one animal into another. SMITH calls the parasites *pyrosoma ligeminum* and regards them as related to those in the red corpuscles in malaria, human and animal; in all probability certain suctorial parasites (*ixodes boris*) play an essential role in spreading the disease.

[1] Sur l'hemoglobinuria bacterienne du bœuf, Acad. des Sciences, 1888 and 1890. Die Aetiologie der seuchenhaften Hemoglobinurie des Rindes, Virchow's Archiv. Vol. cxv, 1889.

[2] Preliminary observations on the microörganism of Texas fever, Med. News, 1889. Also eighth and ninth annual reports of the Bureau of Animal Industry, 1893.

V 2
189

ALI KROZIUS and v. HELLENS[3] described endemic hematuria of cattle in the swampy regions of Finland. These authors regarded the parasites they observed as most likely identical with those already described by BABES and SMITH.

SANFELICE and LOI[4] examined the hematuria of cattle in Sardinia, where it is wide-spread, and concluded that the disease is identical with Texas fever, and the hemoglobinuria of Roumania and Finland.

Very recently CELLI and SANTORI[5] have published the results of their studies of a similar or identical disease occurring in that home of malaria, the Roman Campagna. Their paper is accompanied by a plate illustrating the blood findings. The disease is characterized by fever, acute anemia and endoglobular parasites that probably occur in two forms, but the complete developmental cycles of the parasites have not been traced. In some of the severe cases of the disease hemoglobinuria appears, but this is not so constant or frequent that hemoglobinuria or hematinuria of cattle can be considered as suitable names for the disease. Quinin exercises a curative action in this infection, and for this and other reasons the disease is designated by these authors as *rinder-malaria* or malaria of cattle, a term that seems to the writer at once appropriate, accurate and significant.

CELLI and SANTORI regard this parasitic affection as in the main identical with the hemoglobinuria of cattle in Roumania (BABES), Texas fever (SMITH), the hemoglobinuria in Finland (KROZIUS and v. HELLENS), and the hematinuria in Sardinia (SANFELICE and LOI). The wide-spread occurrence of malarial diseases of cattle may therefore be regarded as established on account of the clinical manifestations, the form and endoglobular situation of the parasites, the nature of the anatomic changes, the development of the disease in malarial regions and in malarial seasons and the curative action of quinin.

This malaria of cattle, though it resembles in the main that of man, presents certain differences. It seems that while the parasites destroy the blood corpuscles and thus cause anemia and not infrequently hemoglobinuria, yet they do not form black pigment and hence melanemia does not occur; in this respect the disease resembles more the estivo-autumnal and rapidly malignant human malaria. Bovine malaria is transferable from animal to animal belonging to the same race or species. The anatomic changes are quite analogous to those of certain forms of human malaria; the changes in the kidneys, the spleen and the liver are stated by CELLI and SANTORI to be quite similar to those found in malarial hemoglobinuria in man by BASTIANELLI.[6] The geographic and seasonal occurrence of bovine malaria corresponds, as indicated in the foregoing, very strikingly with that of the human form. And finally the favorable action of quinin completes the analogy of the two kinds of malaria (CELLI and SANTORI).

In connection with this it is interesting to note that the comparative parasitology of the red corpuscles recognizes not only a human and, as set forth, a bovine malaria, but also endoglobular or malarial infections in frogs, reptiles and birds. Quite recently the investigators in the Johns Hopkins Hospital of Baltimore[7] have demonstrated the occurrence of malaria in certain indigenous birds, showing that the endoglobular parasitic avian diseases are also wide-spread distributions. Observations are also at hand that indicate that sheep, horses and dogs may be subject to similar invasions.

[3] Des hematozoaires de l'hemoglobinuria du bœuf, Arch. de Méd. experim., 1894.

[4] Sull' etiologia della ematinuria dei bovini in Sardegna, Mod. Zooiatro, anno vii, 1895.

[5] Die Rindermalaria in der Campagna von Rom, Centralbl. für Bact. u. Parasitenk., Bd. xvi, No. 15 and 16, May 10, 1897.

[6] Annali di medicina navale, 1896.

TRAUMATIC ENDOCARDITIS.

It is pretty generally recognized that serious lesions of deep-seated organs may result from traumatism that is unattended with obvious external injury, and especially when the affected viscus is already the seat of disease. Thus the lung may be torn, the brain lacerated, a heart-valve rent asunder in consequence of violence expended upon the bony coverings of these parts, though perhaps without severance in continuity. Through the same mechanism may take place laceration of an eroded pulmonary vessel or rupture of a cerebral abscess or of a thoracic aneurysm. In all likelihood similar influences may give rise to inflammatory reaction, as manifested by pleuritis, or meningitis, but additional evidence is needed to convert probability into certainty.

In an interesting communication presented recently to the Berlin Society for Internal Medicine LITTEN (*Berliner klinische Wochenschrift*, June 28, 1897, p. 571) makes a valuable contribution to the subject of traumatic endocarditis. He points out that the injuries to which the heart-valves are susceptible consist in detachment, separation, contusion and laceration of the endocardium, with subserous hemorrhage. These may occur in the absence of all evidence of external injury, even in cases that progress to a fatal termination. Cases in which merely existing compensation for a preëxisting valvular lesion is deranged as a result of traumatism are of course not instances of traumatic endocarditis and do not belong in the category of those under consideration. Those cases also are to be excluded in which as a result of traumatism at any portion of the body microörganisms gain entrance to the circulation and localize themselves upon the endocardium. These represent instances of septic endocarditis secondary to general infection. Most of the cases heretofore described as examples of traumatic endocarditis have been of this kind. Only those

[7] Johns Hopkins Hospital Bulletin, April, 1897.

cases are considered in this connection in which simple benign verrucose endocarditis develops in direct relation with a previous injury to the chest. In the accurate determination of this relation it is essential that the state of the heart before or at the time of the reception of the injury shall have been known, as well as that at varying periods afterward. LITTEN relates three in cases which he believes such a relation to have been established. One occurred in a young man, previously healthy, who was crushed between his horse and a resisting surface. The resulting pain was so severe as to cause the man to fall. When examined he complained of a feeling of anxiety, palpitation of the heart, a sense of oppression and dyspnea, with fever and cyanosis. After the lapse of several months a loud systolic murmur was heard at the apex of the heart and one also over the aorta, together with enlargement of the right ventricle and in less degree also of the left. A diagnosis of mitral insufficiency and aortic endocarditis leading to aortic obstruction was made. While in this case the endocarditis was followed by a valvular defect, in the second case reported perfect recovery ensued.

A laborer employed in the construction of a bridge received a heavy blow in the left side of the chest which rendered him unconscious. He suffered from dyspnea, palpitation of the heart and pains in the chest radiating toward the shoulder, with cyanosis and a small, frequent pulse. The heart appeared to be normal, and recovery had taken place after the lapse of four days. The heart sounds were pure, though feeble. On the fifteenth day a systolic murmur was audible at the apex and gradually increased in intensity. No hypertrophy of the right ventricle could be made out. After the lapse of nine months the murmur had entirely disappeared and could not be induced by active muscular exertion.

The third case occurred in a man who had long been under observation on account of an esophageal diverticulum and had never presented any cardiac abnormality. While ascending a ladder with some stone he fell backward and received a heavy weight upon the left side of the chest. When shock had been recovered from, the heart sounds were found normal for several days. After the lapse of a number of weeks a systolic murmur could be heard, indicative of mitral insufficiency, with hypertrophy of both ventricles.

Numerous cases like the foregoing have been reported, but they lose much of their significance because the condition of the heart immediately after the accident is not noted. Many months may elapse before a murmur becomes audible. A distinction must be made between the traumatic rupture of healthy and that of diseased valves. The latter may take place spontaneously; it is the more common and usually affects the aortic valve. Under these circumstances manifestations of aortic insufficiency set in suddenly and the condition is readily recognized. Laceration of the mitral valve has thus far not yet been observed but only that of the chordæ tendineæ and of the papillary muscles. The prognosis of traumatic aortic insufficiency is more unfavorable than that of the spontaneous variety. Death often occurs before hypertrophy of the left ventricle can take place.

CAISSON DISEASE.

The extraordinary strides which have been made in science and in the arts during the last fifty years have developed ailments which practitioners of medicine previous to the last half century were entirely unfamiliar with, and one of the most interesting of these, from an etiologic and pathologic standpoint, is that condition which has, because of its causative factor, been named the "caisson disease." The great number of large engineering ventures has increased the opportunity for the study of this interesting condition, and in this country the most noteworthy studies which have been made concerning it have been those of JAMINET, who studied the condition of the workmen who were affected by this ailment during the building of the St. Louis bridge, and A. H. SMITH of New York, who has carefully recorded the observations which he made upon a similar class of patients during the excavations which were made for the foundation of the Brooklyn Bridge. Still more recently a most careful and accurate study has been made by Dr. HUGH SNELL during the excavations required for the foundation of the piers of the celebrated Forth Bridge in Scotland. This observer has published the results of his investigations in a little monograph which has recently been published by H.K. LEWIS of London, and in it he discusses the history of the disease, the studies which have been made in regard to its physiology and pathology, and the researches of TRIGER, PAUL BERT, FRANCOIS and others. After doing so he draws upon a rich store of over 200 cases which he has carefully observed for his own remarks.

It is useful in this connection to notice some of the other work which has been done in regard to the study of this affection, which from the time of its earliest recognition has proved itself a never-ending source of interest. It will be remembered that the symptoms of the malady usually develop only when the patient returns to the ordinary atmospheric air, emerging from a caisson in which the atmospheric pressure may have been several times that of the normal atmosphere. The mildest symptoms are dizziness and vertigo with some neuralgic pains in the head, but if the pressure has been high, or the individual is susceptible, these neuralgic pains become most excruciating, darting with fearful velocity about the arms and legs and the head and trunk, and becoming so intense that the patient often declares that the flesh is being stripped